

A Flowering Desert in Miniature

ROGERS McVAUGH

THE CASUAL traveler from the thickly settled northeastern part of our country, coming for the first time to the Piedmont section of Georgia and expecting to find the lush tropical vegetation of the "deep south," will probably be greatly disappointed in his findings. Instead of waving palms and groves of oranges and bananas, he is confronted with a landscape not very different from the one he has just left. Except for the red soil and the ubiquitous chinaberry tree by house and roadside, he might very well be still in northern Delaware or southeastern Pennsylvania. There are a few more unfamiliar-looking pines, perhaps, and scores of the stunted-looking water oaks, but many old friends like the white oak and the tulip-tree deny the presence of any strange flora. Indeed, the flora of the Piedmont section impresses one chiefly through its apparent uniformity and the small number of species represented. A "Pullman-car botanist" can ride a thousand monotonous miles, from southern Virginia to Mississippi, and see scarcely any landscape but the terraced cotton fields and the dry woods of oak and pine that form little islands in the midst of an agricultural immensity. One looks in vain for cool woodland slopes and rich woods with their accompanying luxuriant vegetation.

It has not always been so, however. When William Bartram passed through this part of Georgia in 1773, he was amazed at what he saw: "... the most magnificent forest I had ever seen ... thinly planted by nature with the most stately forest trees ... whose mighty trunks, seemingly of an equal height,

appeared like superb columns. To keep within the bounds of truth and reality, in describing the magnitude and grandeur of these trees, would, I fear, fail of credibility; ... many of the black oaks measured eight, nine, ten, and eleven feet diameter five feet above the ground ... the tulip tree ... and beech were equally stately." Even today, more than a century and a half after Bartram, one finds an occasional rocky bluff that has been too steep or too inhospitable to support crops or grazing animals, with scant relict individuals of the original forest still persisting.

Although the forests have given way to the persistent vanguards of civilization, there still exists a part of the original flora which is unnoticed by the casual traveler and the ambitious agriculturist alike. In all probability this group of species, in its peculiar habitat, has been less affected by civilization than any other similar group in the Southeast.

The Piedmont, or Central Upland, of Georgia is an area comprising roughly a third of the entire state; it stretches across in a great band from east to west, between the Coastal Plain and the mountains, and is characterized by its generally hilly topography and well-drained soils. The soils are underlaid by very hard and very ancient rocks, for the most part granites and gneisses. In many cases these rocks are near the surface and are exposed by erosion, forming large flat or doming surfaces which are usually worn smooth by the action of weather. One of these exposures is mentioned by Bartram, under the name of the "Flat-Rock." Accord-

ing to him, it was a "common rendezvous or camping-place for traders and Indians," and so must have been of considerable size. Similar flat-rock exposures are found in most of the counties of central Georgia, and vary in size from a few feet across to those like the massive Stone Mountain, which covers nearly 600 acres and rises in height some 600 feet above the surrounding eroded plain. The "Camp-meeting Rocks," in Heard County in western Georgia, comprise several exposures totaling hundreds of acres of smooth rolling granite, broken by little groups or trees and bushes where there is soil enough. Other similar expanses are known locally as favorite picnic grounds; the "traders and Indians" of a former day have vanished, but the "Flat-Rocks" retain their appeal as gathering places.

Since the white man first came into the country of the Cherokees these "Flat-Rocks," or "Cedar Rocks," as they are called sometimes, have resisted all efforts to civilize them. The only soil on them forms in little pockets which become totally desiccated by the intense heat of the summer sun beating down upon the smooth rock, so that such exposures of granite are useless for any sort of agriculture. Ordinary plants (and animals!) are totally unable to find a living on the bare surfaces. Their only value lies in the production of building stone, and of that there is an over-plentiful supply!

Barren though the Flat-Rocks may seem to the casual passerby, they form the stronghold of a peculiar and hardy flora; they support during rainy seasons a dense and thriving vegetation of their own, and at the proper time of year they blossom forth with surprising beauty. A few of the characteristic species were known to André Michaux and Thomas Nuttall and other early plant-hunters before 1818

(although mostly not from Georgia). A century ago (1836) a certain Dr. Leavenworth sent to John Torrey in New York specimens of the tiny *Amphianthus pusillus*, which is in many ways the most peculiar of them all. When the shallow sandy pools on the rock-surface are covered with a few inches of water in early spring, this surprising plant sends up a delicate stem to the surface of the water and there produces a pair of leaves and a flower. As the water dries up, the plant flowers again, this time at the level of the ground, as if to take advantage of all opportunities of perpetuating itself!

Since the time of Leavenworth and Torrey many botanists have visited the granite area of Georgia, and most of them have been drawn irresistibly by the huge bulk of Stone Mountain, where *Amphianthus* and many other species are found.

In the early spring, from late February to April, or even to early May, Stone Mountain is a veritable flower-bed. The smooth granite has disintegrated in places into coarse sandy soil and everywhere in the sand are found myriads of plants of *Diamorpha cymosa*, the little annual relative of our sedums, which covers great patches and is conspicuous by virtue of its bright red succulent leaves and stems and pinkish-white flowers. The trout-lily, *Erythronium americanum*, is abundant in places where depressions or crevices have contributed to the formation of a shallow turf. Another lily-relative, the golden-yellow *Schoenolirion croceum*, comes a little later in the season and turns the grassy places yellow with its blooms. Around the edges of the sandy pools are thousands of plants of the diminutive *Houstonia pusilla*, which is a richer purple than its Quaker-lady cousin; in company with it is found another bulbous plant,



*The "Flat-Rocks" as they look in earliest spring. The lower picture shows a nearly level expanse of granite, with a partially filled pool in the foreground. The upper picture is a view of a similar pool, with the pine woods at the edge of the rocks behind it. The dark mass occupying a part of both pools is made up of thousands of plants of *Diamorpha*, not yet in flower.*

the false onion, *Nothoscordum bivalve*, and a little annual chick-weed, *Arenaria brevifolia*, both of which have pure white flowers.

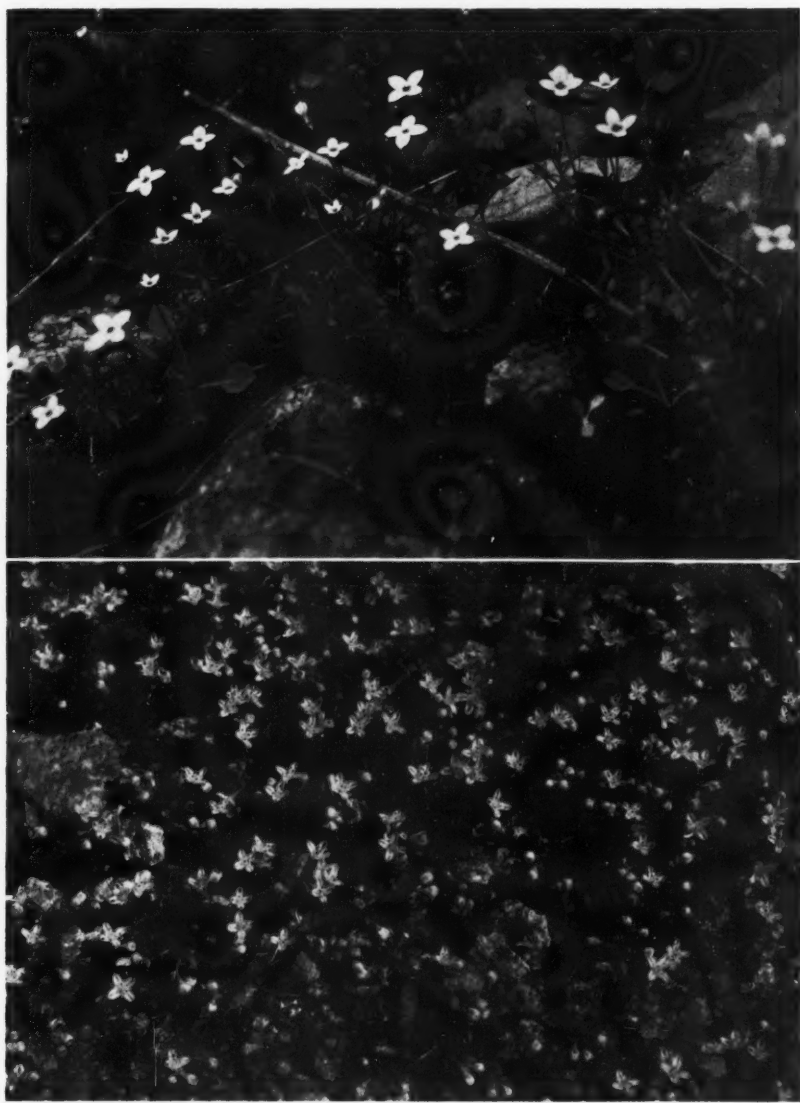
If we take our leave of Stone Mountain, or one of the less famous but equally floriferous "Flat-Rocks," in March, and return to the scene in late April or in May, we are greeted by a riot of color; the richest season of the year is late spring, before the summer sun has dried everything beyond recognition. A host of tall perennials dominates the scene. Thousands of blue delphiniums mingle with the golden-yellow blooms of the opuntias and red-golden kneiffias with flowers nearly two inches across. Countless brilliant sunny *Coreopsis* fraternize with the equally showy red dock, *Rumex hastatulus*, while hundreds of tall panicles of the creamy-white yuccas stand majestically above the rest. In the afternoon, if we are not driven away by the scorching spring sun, we find the ephemeral rose-colored flowers of *Talinum*, a relative of our garden *Portulaca*, beginning to open; the brief flowering period of the purple tradescantia comes then, too. These interesting succulents appear late in spring and persist until fall, but are invisible in winter, only the stout root-stocks being perennial.

Hardy visitors who brave the heat of July and August to come back to one of these granite exposures will find the conditions greatly altered by drought and hot weather. *Talinum* still opens its rose-colored flowers every afternoon and the hardy, sunflower-like *Viguiera* is beginning to turn the grassy patches green again with its new growth, but the spring flora, so resplendent two months before, has completely disappeared. The rigid skeletons of *Diamorpha* still stand erect in the parched sandy pools and prick the hands of careless botanists; the once-

golden *Schoenolirion* has nearly finished shedding its shining black seeds; of the more delicate annuals, like *Houstonia* and *Arenaria*, there is scarcely a trace to be found. Inconspicuous sedges and rushes are fruiting at this time, appearing almost as dry as the already-dead remains of earlier-flowering species. The flat-rocks look dry and deserted; not until early autumn will there be much evidence of growing vegetation.

In September, when the heat of the summer has grown less intense, the rocks begin to flower again. Pink and yellow annual portulacas cover much of the available sandy soil and *Viguiera*, now in full bloom, is a rich yellow. pink polygalas and pinkish-purple annual gerardias are also competing for space in the turfy areas, while several annual sedges of small size serve to hide the bare sand. The persistent *Talinum* still shows a flower or two and the scaly-scurfy *Crotonopsis*, of the Euphorbiaceae, is everywhere. The ordinary autumn perennials, like the asters and goldenrods, although they may be common a few rods away in woods and old fields, are almost wholly excluded from this artistocratic association. In fact, the flora of the granite exposures, the "Flat-Rocks," although so characteristic, is very limited in number of species; hardly more than a hundred can withstand the extreme conditions prevailing there at certain times.

An almost exact parallel to this situation is furnished by desert conditions. In both cases there may be rich soil capable of supporting considerable vegetation, but limited by a scanty supply of water at certain times of year, or by a scanty supply of the soil itself. Plants which can flourish under these conditions are those which can mature seed quickly during periods of wet weather or those having some means



Houstonia pusilla at the edge of one of the "Flat-Rocks." The flowers are bright purplish-blue with a reddish-purple center.

Diamorpha cymosa. The flowers are pinkish-white, with deep pink or purplish anthers. The bright red leaves appear in the picture as black globular objects scattered among the leaves.

of conserving water, including plants with fleshy leaves or stems, like the cacti. In this connection, it is interesting to note that about three-fourths of all the species characteristic of the shallow sandy soil of the "Flat-Rocks" are either short-lived annuals or fleshy or bulbous perennials!

Botanical exploration in these miniature deserts of central Georgia has disclosed much of interest, as well as much of beauty, to the scientist and student of plant life. The botanist has for his problem the why and wherefore of the whole matter; the manner in which the various elements of the granite-flora came to be where they now grow; the

reason why they fail to spread into other, seemingly better soil; the possible development of new species or varieties in this restricted area. The botanist also, be he ever so preoccupied with his problems, can hardly fail to be impressed with the strange barren beauty of these great expanses of granite, nor fail to marvel at the persistence with which life clings to life under the most trying conditions. It seems likely that these peculiar hardy plant-associations will flourish, undisturbed by man or nature, for long years to come, reminding us always that they are one of the last surviving remnants of the first flora of this continent.



The picture gives an idea of the size of the "Flat-Rocks"; this is one of the steeper-sloping ones, near Stone Mountain.

The Illusive Ivy-IV.

ALFRED BATES

WITH this article the work upon the genus *Hedera* which came to an abrupt stop in 1934 will be resumed. During the past six years a new type of ivy has given rise to several forms which are now easily obtained and already the nomenclature is being complicated. In order to place on record the names and descriptions of these new forms before they become as confused as the nomenclature of the older ones, it has been thought advisable to consider them now instead of continuing the work where it broke off. This has a double advantage: first, the article which would have revived the series would consist of a long and dry list of authentic names and synonyms up to and including the year of issue of Hibberd's book which caused so much havoc with the names while promising to be an authority; and second, this group of branching ivies may be considered now before names become badly confused and again at the close of the series as the last division of *Hedera Helix* where it rightfully belongs, unless by that time another complex has developed in the consciousness of this most illusive form of plant life.

Tobler in his monograph on the genus (*Die Gattung Hedera*, 1912) considers *Helix* to be the latest specific development of the genus. If he is correct in this—and it seems logical if we accept his surmise that the original home, or starting place, of the genus was the northern part of India; that the genus spread westward and eastward and as it traveled further away from its original home adapting itself to new conditions it formed new species—then we may expect to find in the

youngest species a tendency to break into more new forms than would be found among the older species. This proves to be the case; for by far the greatest number of varieties and forms are related to *Helix*. Of course human agency has helped this tendency along by encouraging it under cultivation and by collecting from the wild all the slight variations from the type. If the habitat of the Himalayan, the Colchican or the Canarian ivies were closer to hand it is probable that more variations would be found among them than we have now. But the fact remains that by far the largest number of variations now known may be classed under the latest specific development of the genus—*Helix*—which would tend to prove that this species has not yet become static and might even be in the process of evolving new species to meet the conditions here in the western hemisphere especially as all these branching ivies have developed during the past fifteen or more years in its adopted home. And who knows but that the botanists some five hundred years from now will not give specific rank to some plants which will have developed from some of these newer forms of today?

When I say this I know that I may meet with the ridicule of the scientist; but the fact remains that sometimes nature works very rapidly. If in the space of a few years nature can produce a form of ivy such as Merion Beauty or Green Feather—plants so wholly unlike the type in every respect, at least from the horticultural point of view, it is only reasonable to surmise that nature could in a few centuries fix char-

acteristics along such lines so firmly that new species would be the result. However, we are not in the year 2400 A. D., or whatever it will be called, but are here in the present and so must consider these plants as being forms to be classed under the specific name of *Helix*.

At this point it would be well to clearly state what I mean by the terms *variety*, *form* and *sport*. In the classification of plants the term *genus* is used to cover a group of plants which have clearly related characteristics which separate that group from all other groups. Plants within a *genus* are separated into *species* because of minor characteristics within the group such as a thick hairiness on the foliage or a uniform difference in leaf-shape or differences in flower formation, etc. *Species* may be divided into *varieties* according to smaller differences such as *Phlox Drummondii* var. *stellaris* which shows a difference in flower-shape from that of the species; or *Rosa setigera* var. *tomentosa* which has a greater amount of hairs on the foliage than on the species. The term *form* is used to denote even smaller differences within the *variety* such as more crinkled foliage, larger flowers, later blooming period, more robust growth, variegated foliage, etc. To illustrate with a series of ivies: *Hedera Helix* is the specific name for the English Ivy; *H. Helix* var. *triloba* stands for a variety which is exactly like the type save that it is constantly, or usually, three lobed instead of five lobed; *H. H.* var. *triloba* f. *variegata* would mean a plant exactly like the variety save that the foliage was variegated. Such a designation becomes unwieldy to anyone but the botanist or the assiduous collector; so for garden purposes it will be shortened when the occasion arises in the following articles. But the point must

be stressed here to clarify the method of nomenclature.

Now as to the term "sport." I am taking this word to mean a variation which arises from a bud, that is a branch which is different from the parent plant and which carries that difference when cuttings have been made of it and they are grown into plants. As I see it a "sport" may be given the botanic rank of either a *variety* or a *form*; it would all depend upon the amount of difference from the specific plant which the botanist saw in the "sport"—however, this is a point over which we will not worry. In the following I shall use the word "sport" loosely to mean any plant originating as an offshoot from a *species*, a *variety* or a *form*. To express it in more technical language, it is the result of a vegetative change and not a new type resulting from cross fertilization.

The reason I am not considering "sports" as resulting from seed is that so far as I know there have not been any proven crosses made between any of the *species* or *varieties*. To make such crosses scientifically one would need to use the most painstaking care to exclude the small flies that are the chief agents of pollinization by carefully bagging the flower cluster before the blossoms open; and one would need to be *absolutely certain* of the species or varieties with which he was working—he would have to know them in their juvenile stage in order to be certain of the correct names. For this reason it will be safe to consider all the plants dealt with in this paper as "sports" from one development of *H. Helix*.

In the naming of "sports" of all other classes of plants—roses, tulips, phlox, daffodils, etc.—the rules governing the nomenclature call for the use of English and not Latinized names. This rule must apply to ivies also and will be rigidly followed in these papers. In



Henry W. Linn

*Ivy, Pittsburgh
Cutting beginning to sport.*



Claude Hope

*Ivy, Hahn's Self-Branching
(Bridgeton, N. J.)*



Claude Hope

Ivy, Green Quartz

the past this has not always been the case with the result that some of the names of the old forms have Latinized names, many of which have become contorted through careless and ignorant copying. Since about 1900 all European originators of new forms have strictly followed the botanical ruling and there is no reason for American originators not following it also.

"COMPLEXES"

Before dealing with these newer forms it will be well to consider some peculiarities of the species itself. From a horticultural point of view all the varieties and forms of *Helix* may be placed under one or other of several general types of leaf-shape or of manner of growth. Such a classification was partly made by Dr. Tobler in his listing of names in 1927. In this list he divides many of the *Helix* derivatives into sections which he calls "types"—Type palmata, Type variegata, Type deltoidea, Type sagittifolia. While I am not a botanist and do not intend to usurp botanical rights, I am venturing to observe that variegated forms should not be placed in a separate group but should fall into such sections as their leaf-shape warrants. And I suggest that these divisions or groups within the species be termed "complexes" and not "types"; for if we are going to sub-divide the species at all we must consider all varieties and forms in it and so will need to form our divisions not only according to leaf-shape but according to manner of growth as well. Such a division would be more clearly defined as a "complex" than as a "type," especially as the latter term is already used botanically to refer to the species itself. B. D. Jackson, in his Glossary of Botanic Terms, defines "type" as "the ideal representative of a group, genus, or species,"

which would preclude its use save for the typical specific plant and those following closely under it.

Throughout the entire writing the word "complex" will be used to denote a wide division or grouping which has a general similarity of leaf-shape and of manner of growth or of manner of growth only. At this time only one of these divisions is being considered. It is now suggested that this division be known as the *ramosa complex*, for its chief characteristic is the great freedom in branching from every leaf axil as in contrast to the long unbranched stems of the other ivies.

GENERAL CHARACTERISTICS OF THE RAMOSA COMPLEX

The chief characteristic has already been mentioned, the constant tendency to send out branches from every leaf axil at the same time that growth is being made at the tip of the main stem. This produces a mass of foliage instead of a long stem of leaves as in the older types of growth. It also produces a compact and bushy growth, for the internodes are shorter than in other ivies except the well known varieties *minima* and *conglomerata*; but in these two the stems are thick and woody whereas in the *ramosa complex* the stems are slender and pliant and become woody only after several years' growth. Generally the size of the leaves is much smaller than in the older types but one or two of them do have rather large and coarse leaves. There is also, and this is a very important characteristic, a very pronounced tendency to sport into new and distinct leaf-shapes and formations. So great is this tendency to sport that while the complex is scarcely fifteen years old there are at least a dozen distinct variations of it and indications of many more coming on.

By referring to the drawings of the

various typical leaves of the plants of this complex it will be seen that two prevailing characteristics are outstanding. The leaves of all the forms are longer than broad and the two lower lobes are, as a rule, only slightly developed. Secondary points to notice are the clear greenness of the mature leaves, that is there is no trace of grey-green as in some of the *Helix* forms, nor of a purplish bronzy undertone such as is noticeable in some other *Helix* forms. Then also the venation is remarkably clear and distinct for so small leaves and is almost always a pale green with a slight trace of yellow in it and not the greyish white of *Helix* and some of its closely related varieties nor the harsh yellow-green of the *hibernica complex*. All the above characteristics are generalities only and will be dealt with in detail under the various forms as they are described later.

What I am considering as the type plant of this complex does not branch as freely as the sports which are traced back to it; but it branches much more freely than any of the older forms and it has that strong tendency to sport which is characteristic of the complex.

At this point it might be well to call attention to the disinclination of all ivies to adhere consistently to a similar leaf-shape; even on the same branch leaves will often show a great variation in shape. In the *Ramosa complex* this tendency is even more pronounced; very often the leaves on the same stem will show a gradual transition from a five lobed form to an unlobed one. Yet in many cases cuttings taken from such stems do not continue to produce such leaf-shapes but revert to the type, or very close to the type formation. There is also a noticeable diversity among plants propagated from the same stock. In many cases a dozen plants, each differing slightly from the other, could be selected from a batch of cuttings

from the same named variety and arranged in a graduated series which would show hardly noticeable differences between adjacent plants but quite a difference between the first and last. This makes it extremely difficult to say just which is the typical form. And it is especially so because of the deplorable lack of cooperation from the originators who have either ignored questions or answered so vaguely that the replies were useless.

In the following list I have attempted to arrange the plants in chronological order and to give their pedigree. The lack of interest or fear of giving away trade secrets on the part of the originators has made this almost impossible. What accuracy this listing has is due chiefly to the help Mr. Robert Manda has given me in checking over the order of introduction and in supplying the names of the parent plants of the sports according to his recollections of information given him at the time his concern made purchases of the various forms. Data regarding such varieties as have sported in his nursery is therefore the only part which we can accept as absolutely authentic.

In the descriptions which follow I have in all cases given as the length of the leaf the measurement from the base, that is where the petiole is attached, to the tip; in leaves where the base is indented like the upper part of a heart the full length of the leaf extends beyond the measurement given. As this extension varies with almost every leaf, I have taken the points mentioned above, as they give a more constant standard of measurement. As the observations and descriptions are based upon potted plants only, no mention is made of winter coloring. The color terms used for the various shades of green are those in common use and therefore are not as exact as they would be if a standard color chart had been used. My inten-



Claude Hope

Ivy, Merion Beauty



Claude Hope

Ivy, Hahn's Miniature

tion had been to use the Horticultural Color Chart of the R. H. S. but owing to shipping conditions the second series has not yet arrived and the use of the first series alone would only create confusion. In the future articles this color chart will be used, as it is better for horticultural work than others in that it specializes in plant colors.

NAMED FORMS OF THE RAMOSA COMPLEX

PITTSBURGH IVY. Some time prior to 1927 this ivy was introduced by Mr. P. S. Randolph of Verona, Pa. I can give no further information as to origin, as the introducer did not reply to my letter asking for data.

Habit. The growth is compact, as the leaves are fairly closely set along the stem; in no plants under observation have they been further apart than three-quarters of an inch. In plants tied to a support there is only a slight tendency toward branching; but it is much more than in any of the older ivies. However, when plants are not given supports but are allowed to hang down over the rim of the pot or when planted out of doors where the stems lie on the ground the plants branch much more freely. In plants under observation the branching does not occur closer to the tip of the stem than the seventh or eighth leaf down and follows the growing stem in this relation; in many of the later developments the branching is much closer to the growing tip.

Color. The color of the leaves is a deep full rich green which is somewhat darker than emerald and the young growth is only a few tones lighter. The venation is quite pronounced but not so distinct as in *Hedera Helix*; in color it is more a sap green than a gray green.

Shape and Size. The typical leaf has a long central lobe, two well developed side lobes and two slightly de-

veloped basal lobes; however, in many of the leaves there may be merely indications of basal lobes or none at all. The base is indented or heart shaped. The petiole is only very slightly tinged with purple. Typical size is inch and a half from base to tip of central lobe and inch and a quarter across the greatest width. The leaf appears to be much longer than wide because of the extent of the central lobe. See drawing.

Very often plants will develop unlobed leaves but so far cuttings taken from them have not proved constant. Another peculiarity is that often, seemingly for no cause at all, a plant will develop growth which is twice the normal size; that is, the internodes will be twice as long and the leaves twice as large and will always have five distinct lobes. Such plants follow out their idea of doubling by growing twice as rapidly as the normal form.

All of these forms are splendid ground covers and make excellent pot plants either when trained up over a support or when allowed to hang over the rim of the pot.

HAHN'S SELF BRANCHING. In 1927 Mr. Sylvan Hahn of Millvale, Pittsburgh, Pa., found this form in a planting of "Pittsburgh Ivy" and placed it on the market in 1932; this was all the information I was able to extract from the originator.

Habit. After the plant gets established the growth is very compact, as the branching occurs as close to the growing tip as the fourth or fifth leaf back. This makes for a close mat of stems and a dense growth of foliage, as the internodes are usually not more than inch and a half long; however, it sometimes will send out long stems in the usual ivy habit but these will fill in quickly.

Color. The color of the leaves is a



Claude Hope

*Ivy, Green Feather
Natural Size*

medium green rather flat in tone and the young growth is about a pea green. The venation is not pronounced but is marked by a thin line slightly paler than the color of the leaf.

Shape and Size. The leaves vary both in shape and size between those shown in the drawing. The wider the leaf is the less likely are there to be indications of basal lobes and the deeper is the indentation at the base. As the leaf-shape lengthens the basal lobes become more pronounced and the base more nearly approaches a straight line. The size varies from two inches from base to tip and two and three-quarters across the greatest width to inch and a half by inch and three-eighths.

I have grown one plant of this variety in the garden since 1933 and it constantly has to be cut back to keep it within bounds. It makes a dense ground cover but is not attractive enough in either leaf-shape or color to be used as a pot plant.

ALBANY IVY. This was introduced about five years ago by Mr. Fred Danker of Albany, N. Y. Later I understand he gave it a Latinized name which of course can not stand. Request for information from the originator has remained unanswered.

Habit. I am unable to give a full description of this ivy, as I have only a six month old plant under observation. Some three years ago I bought a plant under this name but last summer found to my dismay that it was not correct. Early in the autumn a rooted cutting was sent me by a friend who had purchased the original plant from the originator; therefore the description which follows is made from a small plant and from collected notes and may later be subject to correction. Its habit seems to be a close compact growth with many branches from

ground level and rather small inclination to put out vining stems. It is advertised as "a bushy ivy which may be used as an edging plant much in the same manner as dwarf box" and stress is laid on the fact that it may be trimmed to keep it compact.

Color. The color of the mature leaves is a holly leaf green with rather indistinct venation of lighter green. The young growth is near an apple green and stands out in strong contrast to the older leaves.

Shape and Size. There does not seem to be a typical leaf pattern, for from all the leaves which I have seen there are no two alike. They vary from a normal five lobed form to what can only be described as triangular; there may be various shapes with two lobes only; or some in which only one side of the leaf develops. Then again the margins may be plain, notched or wavy; some may be creased or even folded back upon themselves; and in many one of the basal lobes curls around at the base of the leaf so that it almost forms an immature secondary leaf which may be almost on the same plane as the surface of the main leaf or stand out at right angle to it. The size varies too greatly to give dimensions at this writing.

While it does not make an interesting pot plant, it should be of use as an edging plant where its seemingly deformed foliage would be lost in the compactness of its growth and the rich cheerful green of its leaves.

MERION BEAUTY. This ivy is reported to have originated with Mr. Henry Faust of Merion, Pa.

Habit. The growth is very compact both because of the very short internodes and the prolific branching. In no case are the internodes greater than three-eighths of an inch, in most they are scarcely an eighth. The branching



Claude Hope

Ivy, Rambler

is so free that in some cases it begins as near the tip of the stem as the third leaf down. The effect is a cascade of feathery green tumbling over the rim of the pot. It branches freely from the base of the plant so that except in old specimens the stems are seldom bare. As the plant ages the lower part of the stems becomes woody but even then new growth is often made from them.

Color. The color of the leaves is the same as that of Pittsburgh Ivy, a full deep rich green in the older leaves and several tones paler in the new ones. The venation is also the same.

Shape and Size. The shape of the leaves is also like that of Pittsburgh Ivy, even to the pronounced tendency to produce unlobed ones. In the true plant the leaves are not more than three-quarters of an inch from base to tip and the same dimension across the lobes; BUT there is a larger leaved form which is often confused with this plant.

HAHN'S MINIATURE. Shortly after Merion Beauty was introduced Mr. Sylvan Hahn of Millvale, Pittsburgh, Pa., sent out Hahn's Miniature; in the two letters which I managed to extract from Mr. Hahn no information was given in regard to this plant so I can only surmise that, like Merion Beauty, which is so similar to it, it was a sport of Pittsburgh Ivy.

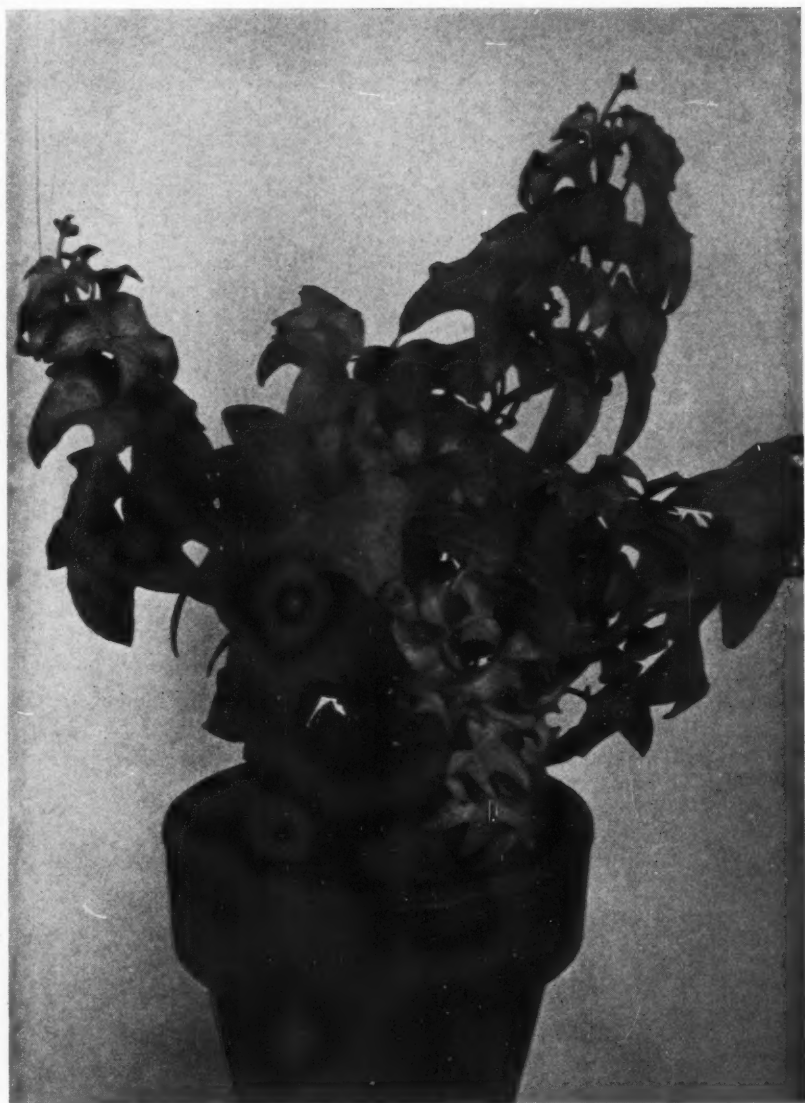
It is an exact duplicate of Merion Beauty except in two things. The leaves are slightly larger and it does not, at least in the plants that I have seen, have a strong tendency to develop unlobed leaves. It is true that some shoots will have some of these unlobed leaves but not by any means to the extent shown by Merion Beauty and very often such leaves will develop as they grow larger into a shape with an indication of two side lobes. The measurements of the largest leaves I have

seen are one and three-eighths from base to tip and one and a half across the greatest width. As the habit, color and leaf-shape are exactly the same as in Merion Beauty there is much confusion between the two and the larger plant is frequently sold under the name of the smaller.

My own confusion was straightened out through the kindness of Mr. Jacques L. Legendre, Vice President of Henry A. Dreer, Inc., who sent me plants of each with the information that his company had got their original stock from the introducers of each form.

GREEN FEATHER. This plant was introduced by Mr. Fred Danker of Albany, New York. I had this plant for several months with out a name and during that time described it in a letter to Mrs. George Weeks Hale of Nashville, Tenn., as looking very much like a green feather. (See illustration.) Mrs. Hale was making an ivy garden at the time and subsequently received plants of it from the firm which had supplied mine; in her next letter she suggested that the name Green Feather be given it. Several months later I found that the introducer had given it a Latinized name, but just what it was I have never known. As a Latinized name has no standing when given to a horticultural form, I wrote the originator, carefully explaining the situation and asking both his permission to give it the name of Green Feather and the Latinized name he had given it. Having had no reply, I am publishing this first description of the plant under the name of Green Feather as a horticultural form in the *Ramosa Complex* of *Hedera Helix*.

Habit. The illustration shows clearly how much more this form is a shrublet rather than a vine. The plant shown is one year old and is not taller than six



Claude Hope

Ivy, Manda's Crested

inches. The internodes are an eighth of an inch in extreme cases; more often they follow after each other so closely that one may say they do not exist. Some of the stems branch very freely and in other stems the branching is only intermittent.

Color. The color of the leaves is a deep holly green which is only a little lighter in the new growth. The central vein is much lighter than the leaf and is quite pronounced but the other veins are hardly noticeable. The stems of the leaves and their under sides are much lighter in color, almost an apple green.

Shape and Size. Reference to the drawing will show the leaf-form better than a description; the type-leaf is always two side lobes, usually pointing forward, and a very long central lobe. Two basal lobes are very, very seldom developed and even when they are they are merely indicated. In many of the leaves there is a constriction or a "waist line" at the base of the central lobe where the side lobes begin; in this form the width of the central lobe is increased. The longest leaf I could find was three-quarters of an inch by half an inch wide; most of them are smaller.

Green Feather makes a charming pot plant and will probably be a great acquisition to the rock garden. As a pot plant it should be watched carefully, for its close set foliage will form a breeding place for red spider.

(PITTSBURGH VARIEGATED.) I am including this form under a tentative name because it should be listed here as the first variegated sport in the complex. In 1938 Mr. Robert Manda found one branch of the typical Pittsburgh Ivy had developed variegation; this was rooted and a small stock of it acquired. In the summer of 1939 this stock was sold to Mr. Carl Hagen-

burger of West Los Angeles, California. My attempt to find what name Mr. Hagenburger intends to give it has met with no success so I am listing it under the above tentative name.

Fortunately a photograph was taken before the stock was sold and I had also made a few notes which are given here. I can not say anything regarding its habit of growth but surmise that it will follow that of Pittsburgh Ivy except of course it will not be as robust in that all variegated forms tend to a reduction both of leaf size and of vitality. The leaf-shape does not have central lobes as long as the parent, at least in small plants. There is a decided margin of almost pure white which sometimes extends rather far into the leaf and there are areas of paler green and of gray green running down into the dark green portion.

It is to be hoped that this plant will shortly be placed on the market, for it is very lovely and should have the hardiness of its parent.

GREEN QUARTZ. In the course of propagating the above Mr. Manda noticed one of the young plants did not show strong variegation and was almost reverting to Pittsburgh Ivy. This plant was set aside and subsequently propagated.

Habit. The habit is much the same as Pittsburgh Ivy save that it does not seem to branch quite as freely; the internodes are about half an inch long and the leaves are larger.

Color. The main body of the leaf is a rich moss green which is much paler in the center of the leaf where it becomes almost as light as a sap green and often there is a splash of yellowish green which is sometimes quite pronouncedly "yellow" in the sunlight. This variegation is chiefly confined to the area on each side of the main vein, is sometimes found along the secondary



Claude Hope

Ivy, Little Beauty
Natural Size

veins (that is the main veins of the other lobes) and is *never* found along or near the margin of the leaf. In this it differs from all other variegated forms where the absence of green is chiefly along the margin. It appealed so strongly to me that I persuaded the originator to introduce it under the above name which the coloring of the leaves suggests.

Shape and Size. The shape of the leaves is the same as those of Pittsburgh Ivy. In size they are somewhat larger, the average measuring two inches from base to tip and two inches across the greatest width. The heart-shaped base of the leaves is always deeper than in Pittsburgh Ivy, which gives the full leaf a longer length. See drawing.

LONG POINT. This is another sport from Pittsburgh Ivy which originated in the nurseries of W. A. Manda, Inc., of South Orange, New Jersey. And I accept full responsibility for adding another name to what to the layman will seem already too many, for its chief assets are the very long central lobe and its distinctive base.

Habit. In habit it resembles its parent except that it is slower growing; the internodes are shorter; it shows even less inclination to branch, however, as the plants under observation are young branching may develop later.

Color. The color is exactly as in Pittsburgh Ivy.

Shape and Size. The leaves are almost uniformly three lobed, the central one being sharply triangular and more than twice as long as the rest of the leaf. The base of the leaf instead of being heart-shaped as in the others of this group curves away from the petiole and toward the apex. See drawing. In size the leaves are fairly uniform, the largest being a scant inch and a

half and one inch across the greatest width.

A minor detail of differentiation is that while the petioles of both the parent and the sport are green without more than a tinge of red-purple, the main stem of the sport is strongly red-purple while that of the parent is not more than flushed with this color.

This may turn out to be only a collector's plant but I am sure that the ivy minded gardener will like it; that is, ivies being what they are, if it continues to be constant.

SPORTS FROM MERION BEAUTY

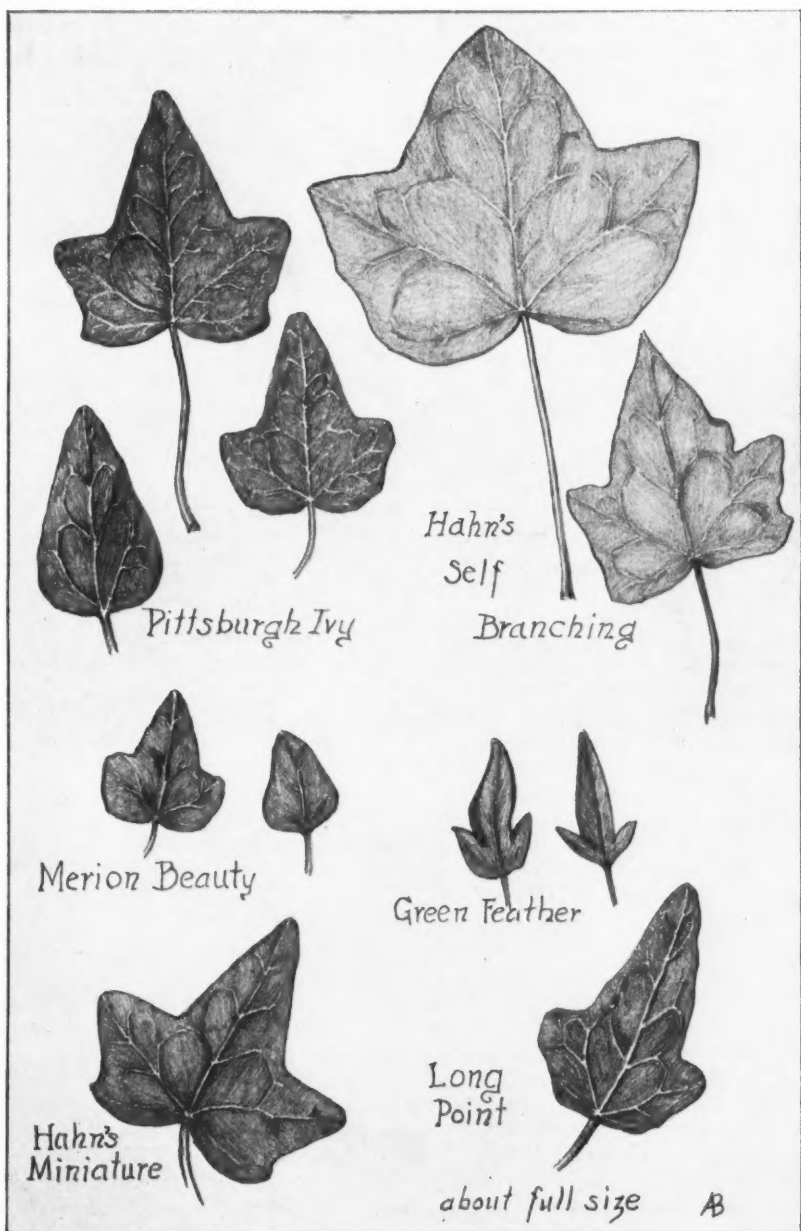
As the remaining three forms have all sported from the same parent and in the nurseries of W. A. Manda, Inc., no further mention of pedigree or originator will be made. None of them is on the market at present because the stocks are not large enough to warrant it. Potted plants were kindly lent me for observation and photographs.

MANDA'S CRESTED. This is an exceptionally beautiful plant both in the coloring of the leaves and their shape.

Habit. The growth is compact and there is a strong tendency to branch from the base of the plant. The internodes are not more than three-eighths of an inch long.

Color. The leaves grade up in color from almost a bright jade green in the older ones to a soft pale pea green in the new growth and this new growth always has a faintly indicated line along the margins of soft rosy purple and sometimes there is also a flush of this color over the leaf itself. The venation is several tones lighter than the leaf and forms a light pattern over the whole surface, as even the smaller veins stand out.

Shape and Size. The leaves are always five lobed; the central lobe is rather long, the next two almost at



right angles to it and the two basal lobes at a sixty degree angle to the side lobes. This formation tends to make a deeply indented base which in many cases is overlapping. The plane of the leaf surface is never flat; in some cases all the lobes curve downward while others, beside having this downward curve, also have an upward curve of the leaf at the junction of the lobes. This gives the foliage a crested appearance. The normal full grown leaf measures inch and three-eighths from tip to base at petiole, two inches from tip to end of basal lobes and inch and seven-eighths across the greatest width. Often there will appear here and there a leaf of greater size.

RAMBLER. This plant might be roughly described as an improved Pittsburgh Ivy with a very pronounced tendency to spread horizontally instead of climbing upward.

Habit. When looking at the illustration one must remember that there are two plants in the pot and not one, as in all other illustrations. The growth is compact and the stems are strong enough to grow straight out without drooping; the longest stem measures ten inches without drooping; after that length the stems begin to sag. The internodes are an inch long. The branching begins as a rule at the sixth leaf back from the tip of the branch, and occurs regularly down the stem. It will be a fine ground cover and should make a good pot plant.

Color. The plant has the same full rich green as Pittsburgh Ivy but the venation is much more pronounced even in the new growth.

Shape and Size. The central lobe is shorter than in Pittsburgh Ivy; the two basal lobes are more fully developed and the base is more heart-shaped. Some extra large leaves, two or three times the normal size, may develop.

The normal leaves are inch and an eighth from tip to base and inch and a quarter across the greatest width.

LITTLE BEAUTY. This may prove to be a better plant than Merion Beauty or Hahn's Miniature, for the texture of the leaves is thicker and the leaves themselves are more interesting. However, it is too early to make positive statements, as all the plants of this sport are the size of the one shown.

Habit. The growth is stronger and more erect than in Merion Beauty or Hahn's Miniature. The branching begins as close to the tip of the stem as the third leaf down. The stems have a strong purplish cast.

Color. The mature leaves are a soft moss green and the new foliage is a deep pea green which in the very young leaves has a pale purple cast over the whole surface. The venation is quite strong, as it is a much lighter green and forms a very interesting pattern even in the young foliage.

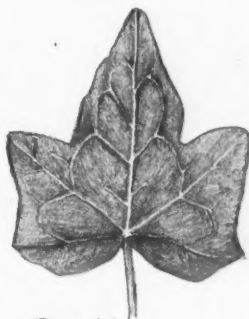
Shape and Size. The leaves are always five lobed with many of them showing a suggestion of extra points at the base. The base may be shallowly heart-shaped, straight across or slightly tapering away from the petiole. The largest leaf measures inch and an eighth from base to tip and inch and three eighths across the greatest width.

NOTES ON CULTIVATION

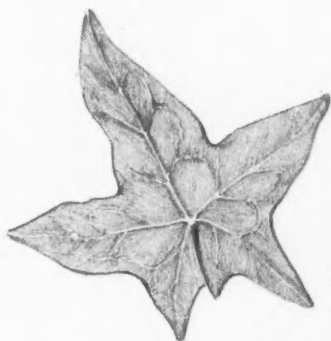
Before closing it might be well to make several cultural notes. Complaints have been made that Merion Beauty and Hahn's Miniature do not do well as house plants, often dying suddenly and for no apparent reason. Both these plants will not tolerate a surplus of moisture and should never be allowed to stand in water. They will do much better when watered sparingly and when the pots have a good layer of drainage material which



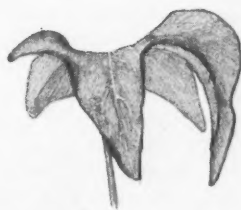
Green Quartz



Rambler



Manda's Crested



Little Beauty



B

slightly more than life size

should include some small lumps of charcoal. Then too the foliage should be thoroughly and frequently sprayed in order to prevent red spider from gaining a hold. A slight attack of this pest will often kill the plants before one notices that the plants are infested. As the foliage is of light texture and close growing the insects' damage is done quickly, sometimes so quickly that it does not have time to even form its tell-tale web.

The best spray for red spider that I know of is Volck; mix in the proportions given on the can and thoroughly spray all parts of the plant; if a web has been formed it must be broken so

that the mixture reaches the insects and all parts of the leaves. Volck does not stain and does not have too bad an odor for use in the house. Selecide is better for greenhouse and out of door use, as it seems to penetrate the web; but it has a terrific odor and it stains; these stains are very hard to remove from porcelain sinks or bathtub—I am speaking from experience.

If one desires these ivies to retain their small sized leaves it would be well not to use a rich soil; my experience has been that the use of fertilizers of any kind produced larger leaves and that an ordinary garden loam was all they needed for normal growth.

The Double Flowering Oriental Crabapples

DONALD WYMAN

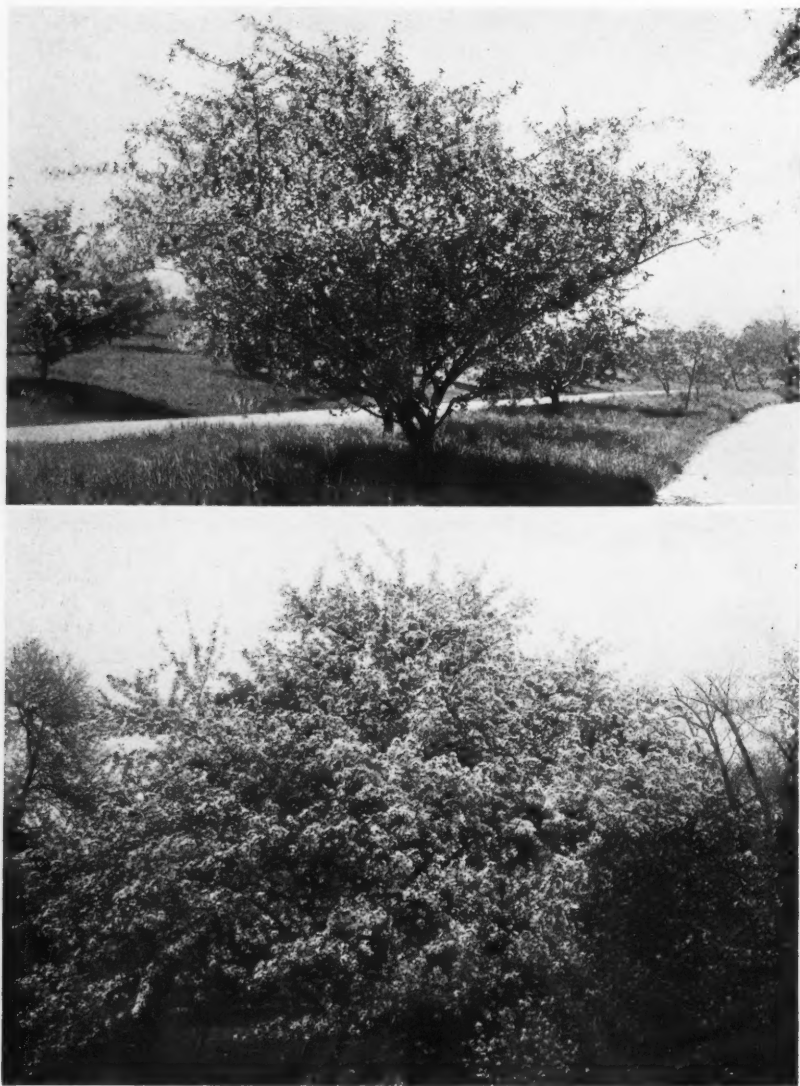
Malus Halliana:

This tree is not as well known in American gardens as its very beautiful variety, the Parkman crabapple. Popularly called the "Kaido" of Japanese gardens, it was long believed to be a Japanese species, closely related to *Malus floribunda* but never found wild in Japan. However, E. H. Wilson found it growing in the wilds of Szechuan, China, and so its true habitat is now known. It was first sent to America in 1862 by Dr. George R. Hall, after whom it was named. Apparently, this same plant was known in Europe as early as 1780 under the name of *M. floribunda flore pleno*. However, it is quite different from *M. floribunda*, for it has a more open, upright habit of growth and its leaves are never deeply lobed as is sometimes the case with leaves of *M. floribunda*. The tree is small and shapely with erect and spreading branches forming a narrow head. The young leaves are a purplish red as they first unfold in the spring. It has deep rose-colored flowers of five to eight petals. Ornamentally, it is not as desirable as its double-flowered variety, the Parkman crabapple.

The Parkman crabapple (*M. Halliana Parkmani*) was also first sent to this country by Dr. George R. Hall from Japan. Dr. Hall had his home for many years in Bristol, Rhode Island, but after graduating from the Harvard Medical School in 1846, he went to China to practice medicine. In 1855 he made a voyage to Japan and was so intrigued with this country that he made several more trips. In 1861 he sent his

first collection of Japanese plants to America, some going to Parson's Nursery at Flushing, Long Island, some to Francis Parkman in Boston, and some to his own estate in Bristol, Rhode Island. From Japan he sent (by F. Gordon Dexter) to his good friend Francis Parkman of Boston a crabapple which turned out to be truly double flowered—hence, Alfred Rehder of the Arnold Arboretum named it after the two men responsible for its introduction into this country. Originally this tree was planted by Jamaica Pond in Boston. It was not until later that it was introduced into Europe. Other plants introduced by Dr. Hall were *Magnolia stellata*, *Sciadopitys verticillata*, *Lilium auratum*, and many others.

The flowers of the Parkman crabapple are semi-double and double, a deep rose color, and about one inch and a quarter in diameter. The flower stalks (as is the case in the species) are drooping and purplish, and the flowers are borne in clusters of from four to seven flowers. The fruits are smaller than most of the oriental crabapples, being the size of a small pea. They are a dull, greenish-red color, and, because of this color and small size, are not nearly as conspicuous as those of many other oriental crabapples. In flower, the tree is imminently superior to most of the others. It must be admitted, however, that in the large collection of crabapples in the Arnold Arboretum at Boston, this was the only one to suffer severe winter injury in the winter of 1933-34. It was not killed outright, but it has taken many years for it to fully recover. Even with this



Arnold Arboretum

Malus Halliana (upper)

Malus spectabilis (lower)



Arnold Arboretum

Malus Scheideckeri

difficulty, the dark glossy green foliage of this small tree (it seldom is over 15 feet in height), its gorgeous drooping double flowers, and dense, twiggy habit of growth make it a desirable ornamental specimen.

Malus spectabilis:

This splendid ornamental is another gift from Chinese gardens, where it, apparently, has been cultivated from time immemorial. It is not known in the wild state but has been cultivated in England ever since 1780, when it was cultivated by Dr. Fothergill. Being one of the taller oriental flowering crabapples, it sometimes grows to a height of 30 feet. The general habit is somewhat stiff, similar to that of the common apple of the fruit garden.

The particular beauty of this plant, commonly called the Chinese flowering crabapple, lies in its flowers. As buds, they are a deep rose red, but when the flowers open, the color fades to a bluish pink. Often 2 inches in diameter, the flowers are single in some cases, semi-double in others. One of the best of the double flowering oriental crabapples, it is, at the same time, the most variable.

The fruits of the plant are not nearly so outstanding. They are yellowish and small, being less than one inch in diameter. Both the flowers and the fruits are easily distinguishable from those of the Parkman crabapple, the first because of color, the second because of size and color. Then, too, *M. spectabilis* has fruits with a persistent calyx, while the fruits of the Parkman crabapple have a deciduous calyx.

Several varieties of this beautiful tree have appeared. The oldest is the variety *Riversi*, which has larger double pink flowers and larger and broader leaves than the species. This is really an old ornamental, having been enthu-

siastically written about and recommended for English gardens as early as 1872. Another variety, *albi-plena*, has double white flowers. Several years ago, I saw a seedling of *M. spectabilis* which Mr. Slavin of the Rochester Parks (Rochester, New York) had selected, and it had even larger flowers than those of the Rivers crabapple. This was, indeed, a perfect specimen in flower and should be propagated and distributed as a first-class ornamental. There surely must be other individuals grown from seed of *M. spectabilis* which show exceptional characteristics and are worthy of propagation. We must constantly be on the alert for such plants, for we need more double flowering crabapples in ornamental work.

Malus Scheideckeri:

The last of the double flowering oriental crabapples to be here discussed is the Scheidecker crabapple, a hybrid between *M. floribunda* and probably *M. spectabilis*. It was first offered to the trade by the great Spaeth Nurseries of Germany in 1888 and was introduced into America by the Arnold Arboretum in 1889. The fruits are yellow and are about ½ inch in diameter, but not so outstanding as some of the other crabapples—*M. Arnoldiana*, for example. The semi-double, pale flowers are borne in great profusion. W. J. Bean, in his *Trees and Shrubs Hardy in the British Isles*, says that this and *M. floribunda* are the two finest of the flowering crabapples.

These, then, are the double flowering crabapples. Although they are few, they have great possibilities in breeding others. There may be clonal selections from these species and varieties that are appearing in the trade. If so, these should be welcomed. We need more of the double flowering forms, since they hold their flowers slightly longer than the single flowering forms and

are, of course, more beautiful. A great deal of hybridization work is being carried on at the Arnold Arboretum with the genus *Malus*, and it is hoped that one of the results will be the appear-

ance of some worthy double forms to add to this hardy group of flowering trees.

*Arnold Arboretum
Jamaica Plain, Mass.*

Cactus and Other Succulents

THE OLD MAN

When all has been said and all tastes considered, *Cephalocereus senilis* remains the most popular of the cacti and deservedly so. In a sort of Gallup poll held by The Cactus and Succulent Society of America it was the general favorite. Its dense long white hair earns for it the descriptive title of Old Man with such qualifying phrases as of Mexico, of the Desert, and of the Mountain.

In spite of the fact that the plant itself and its seed are forbidden export, there are plenty to be had and the price has come down within the reach of the slimmest purse. A seedling of the size that once sold for a dollar is now to be had for fifteen cents; a four inch plant of the size once sold for ten dollars is now only fifty cents and sixteen inch plants are five dollars. About eight years ago, I myself paid seventeen fifty for one that size and at the wholesale rate.

The fact that the dense white hair discourages insects, makes unscarred plants easy to obtain and this added to its willingness to grow anywhere in the house as long as the soil is kept sweet with lime and charcoal, increases its desirability. Its amazing and attractive appearance makes it outstanding in any collection. No other cactus is at once, so long-haired, so white and so startling. It graces any garden and any window sill.

Because of its slow growth it is wise to get as large a plant as can be afforded. It is said to take forty years to grow about twenty feet, and from experience I know that it takes five years to grow it to its first four inches. A bed of two thousand such as exists in at least one California nursery is an unforgettable sight, a field of living snow.

In the Huntington Botanic Gardens in San Marino near Pasadena are huge specimens that are so dirty and gray that this descendant of scrubbing Netherlanders at the sight of them longs for a pail of warm soapsuds, a brush and a ladder. I am sure they would welcome a bath and be better and handsomer for it. Plants are very much like people!

NEFF K. BAKKERS

San Diego, Calif.

TWO EXTREMELY WORTH WHILE HARDY CACTUS

Neobesseyia missouriensis is one of the finest of the small cushion type. The individual plants are tiny, an inch to inch and a half, and increase around and around, making compact mounds. The edges of the little cushions come smoothly and tightly together so that the sides of the mound, at all times in its development, come down snugly against the ground, with the center raised, something like a shallow bowl, inverted. These occasionally reach the

diameter of a dish pan but usually even the old, old mounds do not exceed a dinner plate in size. In early summer they are covered, almost completely, with glistening amber to greenish flowers. The spines are white and lie flat, making a very pretty pattern over the surface of the dull mounds. The great beauty of this cactus is its shining scarlet berries, about the size of a coffee berry, which appear soon after the flowers fade and continue to glow brightly until the next blooms force them out. The berries grow between the fleshy projections from the tip of which the thorns emerge. This leaves them below the spines and adds to the beauty of plant, making it one of the most attractive in the rock garden, especially in winter and early spring, when the berries seem to be at their largest and brightest. A smooth compact mound, studded with its bright, shining berries below the lacy, white thorns is a delightful sight.

Coryphantha vivipara is larger than the former; two to three inches. The individuals are separate and distinct, though they, too, increase by offsets around the original. They, however, form a cluster of small cactus, rather than merging into a compact whole. The spines extend outward and are quite long. The glory of this cactus lies in the exquisite, glowing rose of the relatively large flowers, which it bears in abundance. The fruits are not attractive, being an inconspicuous, dull green about the size of a thimble and burst when they are ripe, unless collected by the birds first. We have found this cactus growing on the lip of a rock where there was hardly soil enough to anchor the roots, but blazing out its beautiful flowers as gloriously as others more favorably located.

MRS. H. P. MAGERS

Sterling, Kans.

Rebutia minuscula (Web.) K. Schum.

One of the amusing and possibly saddening things about gardening is that each generation of gardeners has to find out for themselves much that has been known for years, has even been recorded in some detail. The present gardener is no better than the rest of his kind but does have a sneaking fondness for looking through old bound copies of gardening magazines to discover what he may.

Recently in looking up a reference in *Revue Horticole* in the volume for 1912, the book opened to a color plate of the cactus there recorded as *Echinopsis minuscula* Web., a plant of which had lived out its life span on the office shelf, bearing a crop of delightful small red flowers, some of which actually ripened fruits and produced good seed, from which a new crop of plants has been raised, but not on the office window-shelf!

To quote M. Roland-Gosselin, whose remarks are as pertinent today as then: "This charming small cactus flowers in a good clump in its second year from seed and its numerous flowers of a brilliant red color make it very ornamental. Its culture and its easy multiplication warrant for it attention in all cold countries where it might survive out of doors.

"The specimen at the Museum, figured here, is five or six years old from seed and bore last March thirty-two flowers and over thirty off-sets closely packed and superimposed one above the other so that the base of the old plant is not visible.

"Usually the flowers are fertilized naturally and the fruits that mature in less than a month, mature a large number of seed which should be sown at maturity. They will germinate in eight days, providing a rapid multiplication.

"Cultivated in large pots which may

contain a good number of plants, this small *Echinopsis* is charming especially when covered with flowers. It grows well grafted when small, in size no larger than a pea, upon the solid stems of *Cereus Spachianus*. It is enough to place the young plant exactly on the center of the axis, taking care that the two sections are exact and smooth. It is scarcely necessary to fix the union if the temperature is slightly raised. The grafts grow with surprising rapidity and flower even more abundantly.

* * * * *

"The culture is most simple. Good soil rendered porous by the addition of ample amounts of coarse sand; perfect drainage; practically no water from the end of November to the end of February. At that time, if there is sign of flowering, water may be added gradually, but only on fine days. In May one may move the pots to the open air or better still transplant them to beds of properly prepared soil. Used in this way they make an excellent border. During the warm months the watering may be copious and daily.

"In October, when they are lifted, the watering must be reduced.

"If the sun is useful in winter, in summer a little shade will help. These plants grow in the Argentine where various grasses provide just this sort of shade during their growing period. * * * * *

The translation of course is very free. The enthusiasm is very real and the plants that grow here in a green glazed pot that came from Mexico, while they may not be models of perfection, provide the usual pleasure that can always be had from the beautifully rhythmic green growth with the stars of fine bristles over their surfaces.

CACTUS SEEDLINGS

To old hands at cactus growing, no

special word need even be said about the beauties of their plants. To those who have never considered them specially, a note may be an open door to the beauties of form that are always a part of the plants' claim to attention.

Various cacti have lived on the office window shelf for some years in their separate small pots and delighted us with their annual increase in diameter and the gradations of color from the newest center to the oldest periphery. Recently, Mrs. Bakkers sent some new ones that are so charming in their ordered symmetry that a special word is provoked.

In an oblong Japanese pot of dull gray blue sit twenty young mammillarias in nineteen species. Being a careless person, they have been arranged in alphabetical order from *Mammillaria bocosana* to *M. Woodsii*! This, of course, is a stupid procedure, since no alphabet could possibly be expected to bring about the optimum juxtaposition of color, spine or form. Perhaps too it is a foolish pleasure, since a delight in ordered rows of diversified round objects is elemental, almost child-like. However, they have pleased more than one who has seen them.

M. bocosana Poselg. from northern and central Mexico has bright green almost cylindrical mammae topped with bunches of fine bristle-like white radial spines ending in silky hairs that almost hide the brownish central spines that are stiff and hooked, and give the plant a silvery, misty look that quite belies the firmness of the central spines.

M. calacantha Tiegel is much more compact with shorter mammae that are more radial and a grayer green. At each tip there is a starry arrangement of thin white bristly spines and a central tuft of brown spines that project outward.

M. conspicua J. A. Purp. from Mexico is represented by an even more

compact darker green plant with small closely set tubercles, so closely set that the starry radiating white bristles almost cover the entire surface and form a silvery foil for the larger, ascending, very stiff brown central spines.

M. decipiens Scheidw. from Mexico with large cylindrical tubercles looks as if it might grow far larger than some. Each tubercle is topped with a stiff lemon-white star of needle-like radial spines and one longer central spine yellow now but to become brown later on.

M. dolichocentra Lem., now *M. tetracantha* Salm-Dyck to some, is a taller, darker, duller green seedling with larger tubercles, stiff radial spines tipped with brown and ascending, incurving central spines of dark brown, almost black at their tips.

M. durispina Boedeker from Central Mexico, like the last, is a larger plant with still darker green but similar colors on the spines.

M. clongata DC. from western Mexico is one of the branching forms and already in this juvenile one-inch plant has six branches close about its base. The color now is pale apple green and the whole surface is obscured by the pattern of pale yellow stars of spines that make one think of coral. A much larger older plant has lived here for some time but has never bloomed since it came from the greenhouse, so we have never had its masses of straw-colored flowers.

M. Fischeri Pfeiff. from Oaxaca in Mexico is a short and stubby infant here with relatively large tubercles, dark but glaucous green, with shorter radial spines than most and the promise of much longer darker brown central spine.

M. Hahniana Werd. and Backbg. is again a globular form with smaller tubercles, closely set and leaf green in color. They appear much more blue

in effect because each tubercle bears a fluff of long, white hair-like bristles, with white central spines tipped with reddish brown. These, close together near the growing tip, give a spot of warm brown at the center of the plant.

M. Hamiltonhoytea Werd. is a chunky fellow broadest at the top with moderate sized gray green tubercles tipped with rigid stars of short, white, radial spines and incurving brown central spines.

M. Kelleriana Schmoll is dark green with large tubercles and stars of yellow, brown-tipped radial spines and longer central spines, the uppermost the longest. These make a dark brown upright mass in the growing center.

M. magnimamma Haw. has large tubercles of dark green, somewhat grayed, that seem more separate from the central axis than in some of the others here. The radial spines are fewer, shorter, almost white but black-brown on their tips, especially when young.

M. Mendeliana Werd. is almost globular, but a little broader at the top. The tubercles are small, closely set, with fine white stars of radial spines and longer central spines, the uppermost the longest. As they are dark brown, this gives a fine effect.

M. mystax Mart. in this stage is almost a sphere of moderate-sized apple green tubercles with straw-colored stars of radial spines that recurve toward the plant, and much longer, also recurving central spines that pass from straw color at the base to brown at tip.

M. Schiedeana Ehrenb., the smallest in our seed pan is a tiny sphere of rather longish conical tubercles of deep yellow green and reflexing stars of fine gold spines, white when old. It is a charming thing. "At a distance it looks like gold plush."

M. sempervivi DC. is one of the stubby ones, broadest at the top with closely packed rather conical tubercles with few radial spines that soon drop off and short, stiff dark brown central spines.

M. tetracantha Salm-Dyck among these seedlings does not exactly resemble *M. dolichocentra* already described and these are supposed to be synonyms by some. It is broader at the base, a yellowish green but with similar spines. Here perhaps is a taxonomist's sneer—but no matter, it is a visual delight!

M. Vaupellii Tiegel. This is an astonishing plant broadest at its top, the blue green rather small mammae entirely hidden behind the interlacing stars of the white radial spines. The central spines are longer, yellow brown and make a sea urchin-like cover to it all.

M. Woodsii Craig in ed. This is a rather squat form with small tubercles of dark green each tipped with a tiny

star of white radial spine from which rise the brown central spines of which the lower is the longer. These make a spot of brown in the growing center and stand over the rest of the plant like rapiers thrust downwards.

Since *Mammillaria* is a large genus, over two hundred species being admitted and some variants, it is obvious that such collections as this might be infinitely varied. To one person they are an infinite delight, to another a stupidity. While, doubtless, the writer would never have moved to discover them for himself, in spite of several fine oldsters here already, he can see now an amazing range of perfect form and pattern in which lie many expressions of plant beauty.

The soil, of course, is fifty per cent sand, the drainage perfect, the watering once a week or less—and light as much as can be had on a shelf before a south window.

Rock Garden Notes

ROBERT C. MONCURE, *Editor*

At Last, a Worthwhile Arabis

The true *Arabis Ferdinandi-Coburgi*, as delightful in name as in the rock garden, is a worthwhile addition to any collection. This native of the Balkans is listed by a few nurseries, but the plants so designated are mostly less desirable relatives. The plants in the Cornell Rock Garden originally came from a nursery in northern New Jersey. In my travels about the country I have looked for this species; apparently few persons grow it.

This rock cress is notable for its evergreen foliage which provides in-

terest throughout the year. The dark green, irregular rosettes form a cushion some five inches in height. The flowers, one half inch in diameter, are pure white and are borne in racemes four to five inches above the leaves. The contrast between the white blossoms and green foliage produces a striking effect during May.

Although *Arabis Ferdinandi-Coburgi* is rarely seen in rock gardens, it is easy to grow. A loamy soil which is moist but not wet and full sun for most of the day (or continuous light shade) have given the best results at Ithaca.



Warren C. Wilson

Ground cover plants, Cornell University Rock Garden.

Even though the plants at Cornell have never set seed, the flower stems are removed for neatness' sake as soon as the blossoms fall. The plants are dug, divided, and replanted when the mats become so large that they die in the centers. The plants are subject to burning during the hot, dry days of summer unless given ample water. They will withstand sub-zero temperatures, but the evergreen foliage will suffer from the winter winds and sun unless mulched with glass wool or some other light material.

WARREN C. WILSON

A New Effect from Ground Covers

A recent development in rock gardening, an adaptation of the ground cover idea, gives the "alpine lawn" effect. This is created by the use of

rather large numbers of spreading species set close together in groups of single kinds, so they almost completely carpet the ground and partially conceal the rocks. Taller plants are used sparingly in small groups or singly. The contrasts and harmonies in plant forms and flowers, in foliage colors and textures, give sustained interest throughout the year. The matted plants also tend to prevent washing of the soil, weed invasion, and heaving by frost.

Many ground covers are being used in the Cornell Rock Garden at Ithaca, N. Y. The following are a few of the particularly valuable ones useful for giving the "alpine lawn" effect:

Alyssum montanum — a good carpeter, five inch mats of grayish leaves; flowers yellow, profuse, in May and



Warren C. Wilson

Sedums planted on a natural shale outcrop for ground cover effect in Cornell University Rock Garden.

June; sun; a rapid grower, shear after blooming.

Arenaria verna var. *caespitosa*—the old favorite for cracks between stepping-stones; dark, evergreen, moss-like mats an inch high; the flowers are small, white and unimportant; sun or light shade in soil that does not become dry. (The form *aurea* is yellowish green and looks well with the green form if used in smaller quantities.)

Globularia nana—dark green, evergreen mats an inch and a half high; flowers light blue, stand an inch or so over the leaves, in June; light shade.

Helianthemum nummularium var. *grandiflorum*—dark green, persistent leaves in dense mats four to five inches in height; cover with yellow flowers in

June and July; sun; will stand rather dry conditions; shear after flowering.

Herniaria glabra—a tiny evergreen creeper not over one half inch in height; flowers inconspicuous; light shade and moisture.

Nierembergia rivularis—a five inch carpet of long-petioled, deciduous leaves from creeping stems; upturned, bell shaped flowers two inches across, white with a golden throat, in July; sun and moisture; not entirely hardy north of New York City unless mulched.

Potentilla verna var. *nana*—a mat-former four to five inches high, leaves persistent; flowers golden yellow in May and June; sun; avoid rich soil and excess moisture.



Warren C. Wilson

Cornell University

"Alpine lawn" effect with ground cover.

Thymus brittanicus — forms rapidly spreading, dense mats five to six inches tall, leaves gray, hairy, evergreen; flowers rosy lavender, June; sun; shear after flowering.

The maintenance of a ground cover planting is less, I believe, than that for the usual type of planting in a rock garden. Once the plants have covered the ground, relatively few weeds appear. Two or three thorough weedings each year are sufficient for most gardens. During dry periods water must be supplied or the plants will burn and become unsightly. Shearing

the plants once or twice a season will increase the density of the mats and keep the plants from becoming too tall. A light application of a complete fertilizer in early spring will help keep the plants in a vigorous, healthy condition. However, it is wise to divide and reset the plants every three or four years. This should eliminate the die-out in the centers common to almost all mat forming plants. Winter injury can be avoided by mulching with glass wool or some other efficient mulch.

WARREN C. WILSON

Rhododendron Notes

CLEMENT GRAY BOWERS, *Editor*

New Hybrid Rhododendrons

It seems to me that the most telling advancement in "true" rhododendrons for the milder sections of the eastern United States occurring in the last decade has been in the multiplication by seeds of the various forms of *Rhododendron Fortunei* and other members of the Fortunei Series. Variant forms of these, including forms of *R. decorum*, *R. discolor* and the less impressive *R. Fargesii*, with possible hybrids with others and with these *inter se*, are now showing up in quantity and are large enough to bloom and show some of the characters of maturity. Many of these display fine features. I saw them first a dozen years ago when Mr. C. O. Dexter of Cape Cod began raising them extensively from seed. Subsequently they have been disseminated somewhat. This May I had the good fortune to study a splendid collection of Dexter seedlings, as well as a number of others acquired from other sources and by original production, in the garden of Mr. Samuel A. Everitt, near Huntington, Long Island.

As a rule, the flowers are much larger than those of the ordinary Catawba rhododendrons; many of the individual flowers are four inches or so across. They occur in fair-sized trusses of a dozen or more flowers, but without quite so many flowers per truss as in the average Catawba; occasionally, however, the trusses are quite full. In color, they are much clearer than those of our American sorts, by which I mean that they seldom have the purplish or lilac overcast which is so common in the Catawbas. One of Mr. Dexter's original plants, which is doubtless a named variety imported

from England but which is at present unidentified except for the temporary designation of "Dexter's No. 9," is of a delicate blush color with a distinct apricot tinge. This apricot or salmon tint, with its slight suggestion of yellow, has reappeared in several seedlings and is a delightful thing.

Another important feature, and quite delightful also, is the sort of fragrance which most of these seedlings possess. If you can imagine the scent of a gardenia diminished to a point of subtle delicacy, and subdivided into several minor degrees of flavor, some a bit spicy, you will have some idea of the range of fragrance among this group of plants. As a rule, these large, sweetly scented flowers bloom with those of *Rhododendron carolinianum*, about ten days prior to the main group of Catawba hybrids. The Mollis Azaleas also bloom about the same time. Their leaves are a bit larger than those of the rhododendrons we are commonly accustomed to and their habit of growth is robust. Upon occasion they have withstood temperatures of ten degrees or so below zero Fahrenheit without being killed, but one or two nights of exceptional cold without dire consequences does not by any means establish a claim to hardiness in regions where such is the common rule. In justice, I should say that some of them may have been more fully tested for hardiness, which I have not yet learned about.

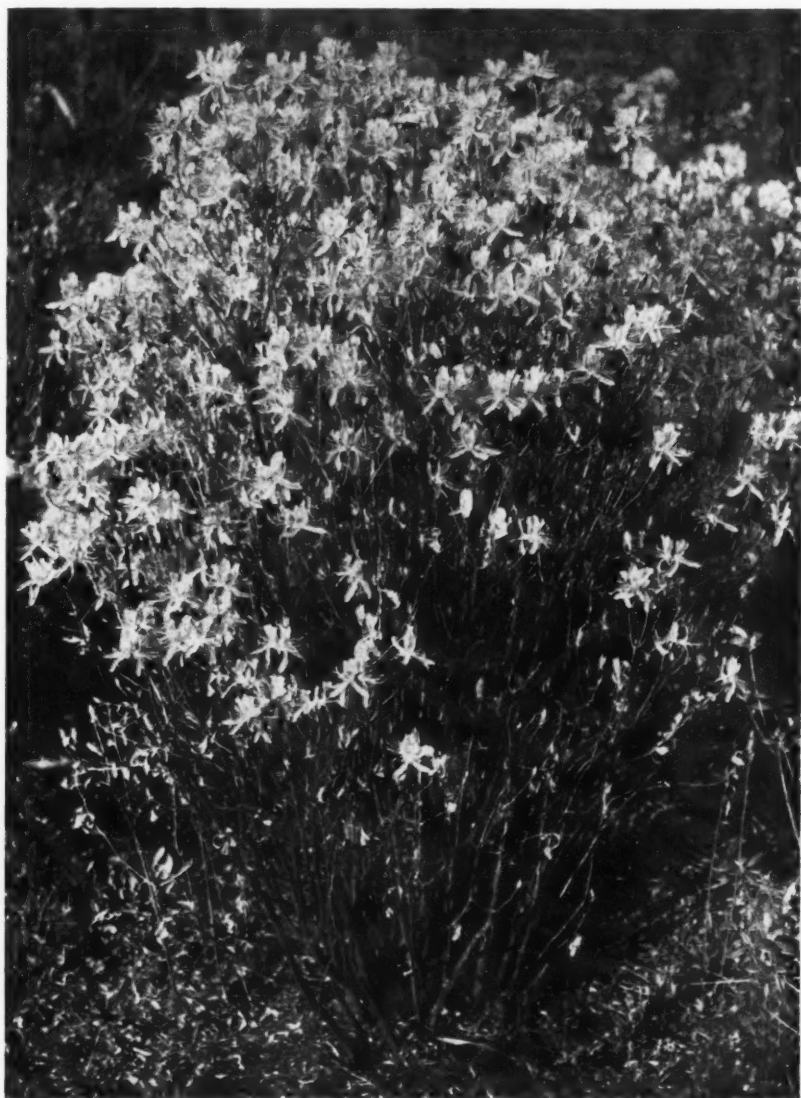
It seems evident, both from the historical literature and by observation of specimens, that *Rhododendron Fortunei* and its kin has played a part in the pedigrees of certain of our Catawba hybrids. The fine red variety, Mrs.

Charles Sargent, bears evidence of such an infusion. Yet the part played seems to have been a small one, and the other species appear to have dominated. Mr. Lionel de Rothschild has written that, many years ago, he used members of the Fortunei series extensively in crosses with Catawba hybrids and got nothing worthwhile. I have made a number of such crosses within recent years, without achieving any distinct advances with the Catawbas, but with promising results in other directions. So it is not surprising that we have not seen greater evidences of the Fortune rhododendrons among our hardy hybrids, which, in the main, have always been of the Catawba type.

During the last fifty years, several species of the Fortunei Series have been grown quite extensively in England and it is incredible that many forms of these have not found their way to this country. Presumably they have. Yet few are to be found now in America and there are records of failure here. Why, then, after seventy years or so, are these species succeeding here now? The answer is at least threefold: First, because we know more today than formerly about soils and the relations of growth and hardiness (which I shall discuss a bit later); second, because the present work has been carried on amid unusually favorable surroundings; and third, because most of the plants brought to America in the old days were European introductions — named varieties, grafted, which had proved their worth abroad, but which were not produced primarily for America. Only in recent years have seedlings been grown extensively over here. Now, seedlings of these Fortune rhododendrons are quite variable, and, with the extensive trial of seedlings, such as is being carried on by Messrs. Dexter, Everitt and others, it will not be surprising if certain indi-

vidual plants appear which will be greatly above the average hardiness of any previously known in this country. Some signs of this have already appeared, but not yet hearing of more definite evidence to this effect, I shall reserve present judgment and look to the future for ultimate results.

Mr. Everitt's plants are now of good size, many being four to six feet tall, and are displaying a wealth of bloom and a mature character of growth which permits one to evaluate their ultimate possibilities. They are very happy in their glade-like environment and are kept in vigorous growing condition by careful and constant attention to soil fertility and water requirements. They are growing in a protected spot, where there is shelter from the wind, and their situation near the water of Long Island Sound gives them a congenial environment where extremes of temperature are moderated. In other words, these plants are favored with a somewhat better environment and better horticultural care than could be generally expected in the average garden. Similarly favored conditions obtain also in Mr. Dexter's garden near Sandwich on Cape Cod. I mention these facts in connection with the description of the plants, because they are important in evaluating hardiness and vigor of growth. Not only does the mild environment produce an even, uninterrupted growth-rate throughout the season, but the vigorous growth produced thereby is a definite promoter of hardiness. As has been previously pointed out in this column, the azalea or rhododendron plant which makes vigorous growth during the spring and summer is prepared to go through a subsequent cold winter with less injury than the plant whose growth in the summer has been checked or inhibited by insufficient water, unsuitable soil, lack of plant food, competi-



Claude Hope

[See page 236]

The Rhodora, Rhododendron canadense

tion, too much heat, a poor graft-union or any other retarding influence. Thus the two factors of growth and hardiness sometimes work together. Such environmental influences for good or ill are often spoken of as ecological factors. Rhododendrons and azaleas need an uninterrupted season of growth. This is why they do so well in a mild climate like that of England. That, too, is a reason why the oak-leaf mulch is generally needed as much in summer as in winter—to maintain uniformity of moisture in the soil.

A combination of good ecological factors which favor both vigor and hardiness, therefore, is an essential characteristic of both the Dexter and Everitt gardens. As a sidelight upon what might be expected from the average gardener, who is prone to neglect his plants, if he were to tackle some of the Fortune rhododendrons, I might mention the fact that several plants of one variety now growing very satisfactorily for Mr. Everitt—a clone called "Mrs. Charles Butler"—were previously growing elsewhere on Long Island, where they proved quite tender; but in the other place they had not received the shelter or care which they now obtain. Whether such will be the fate of the many fine Fortunei varieties which we may soon expect to see in the trade, or whether some of them will be tough enough to withstand the rough and ready conditions of the average northern garden, which is generally too hot in summer and too cold in winter, I am not in a position to predict. It is possible that some have already proved themselves, but, to be conservative in advance of such definite information, I would venture to guess that the present crop of seedlings of the Fortunei Series, will prove wonderfully satisfactory when grown in sheltered gardens where the winter temperatures seldom go much below zero and where

the gardener is sufficiently interested and adept to keep them in a state of healthy vegetative growth every summer. It may require some more work in hybridization with more "ironclad" species before the Fortune rhododendrons as a class will become tough enough to withstand the ecological conditions that rhododendrons generally have to endure in this country.

At any rate, the present work is very significant and one hopes that it may continue until the various members of the Fortunei Series have been thoroughly tested in seedling material and also in hybrid combination with such other species as may prove useful. In this way only shall we develop useful American races of plants that are adapted to the peculiarities of our climate. One cannot too strongly urge the growing of plants from seed, in relatively large quantity, in order to uncover useful variants, for this is the usual route through which valuable new individuals are discovered.

CLEMENT G. BOWERS

Rhododendron canadense Zabel (See page 235)

The rhodora is usually thought of as a northern shrub and one, moreover, that exhibits certain marked predilections for situation. When it was proposed to grow it here in Maryland several New Englanders whose opinions were valued assured us that it could not be done, because this location is too far south. As compared to the reported range "Newfoundland to Quebec south to Pennsylvania and New Jersey," this does seem far south, but the only difficulty encountered to date has been the same that overtakes many an azalea here, namely premature growth caused by winter warmth. This has resulted in loss of bloom as well as damage to shoots on more than one occasion.

Here the small rose-purple flowers

which do appear before the leaves, are sometimes overtaken by the growing shoots, so that the warm pinkish flower masses are overclouded by gray green leafy shoots. Doubtless in its more natural habitat, this would not occur.

If one follows the classification of Rehder and Wilson "A Monograph of Azaleas" (1921), it occupies the Section *Rhodora* of the Genus *Rhododendron* with *R. Vaseyi* its only American kin and the Oriental *Albrechtii*, *pentaphyllum* and *nipponicum* its allies there.

Of these *Vaseyi* is well known and has already been illustrated in our journal. *Albrechtii* is represented in our collections but does not grow with any particular zest and as yet shows no signs whatever of flowering. In its growth characters this plant does not so much resemble *Rhodora* as it does some of the species in the Section *Sciadodendron*, particularly *R. Schlippenbachii*.

In Rehder and Wilson (l.c. p. 185) are recorded two hybrids in which *R. canadense* as seed parent was pollinated with *R. luteum* to produce $\times R.$ *Seymouri* and with *R. japonicum* to produce $\times R.$ *Fraseri*. This latter was represented in the collections at the Arnold Arboretum in 1927, and a drawing of one flowering shoot was included in

this magazine for October, 1927, made in May of that year. As yet, no record has been found that this is offered in trade.

It is interesting also to observe that this American plant was illustrated in 1800 in Curtis Botanical Magazine (t. 474) with an excellent figure and very brief notes, the most important part of which is that it "was introduced in 1767 by Sir Joseph Banks, Bart."

B. Y. M.

Tuinbouw Encyclopedie Vol. I. De Azalea indica L. (*Rhododendron Simsii* Planch.) by H. Scheerlinck Dr. Sc., Joz. Baumann, Fr. de Somer, Aug. Haerens en A. Van Leere.

De Sikkel, Krius hofstratt 223 Antwerp. Wereldbibliotheek N. V., Amsterdam.

Contents, History, Botanical Studies (History of the names, related species), Seeds and Grafting, Cultivation (General factors, heat, light, forcing, soil, etc.). Special cultural practices (Cutting, grafting, etc.), Fertilization (Soil requirements, analyses of plants and soils, etc.), Insects and diseases, Description of Varieties (188-382 pages), Commerce, Care and production of forcing plants, Use as house plants, Biographic notes on principal horticulturists and botanists. Lists.

A Book or Two

The Genus Tulipa. Sir A. Daniel Hall.

The Royal Horticultural Society, Vincent Square, S. W. 1, London, England. 1940. 171 pages. 40 plates in color, illustrated. One pound two shillings.

The wild species of tulips have been the object of devotion among gardeners for many a year and for some time have

been the special concern of scientific investigators who have busied themselves with problems of their relationships and have turned on the problem all the ingenuity and skill of modern scientific research to unravel some of the problems that appear to thwart any other type of approach. In this book which Sir Daniel modestly feels is only

the report on findings that may serve as the basis of new and more complete studies, we have reported the findings of the author and his assistants to the present time. He considers it as an addition to the usual procedures of taxonomy as usually practiced rather than as a proof that they are a substitute for such studies.

After a chapter on the history of the tulip as it came into cultivation, there are presented chapters on the morphology of the plant and on the cytology of the species, after which he proceeds to the presentation of a key for use in determining the species and a discussion of the species themselves.

"The author has for many years been growing all the species that are obtainable in western Europe, and it is his contention that the identity of most of them can only be determined by studying them in the living state. Diagnosis from a dried herbarium specimen, collected by a botanical explorer, is a very uncertain proceeding, since many features are obscured and no information is usually available as to its habit of growth, time of flowering and range of natural variation. Above all the chromosome complement can only be determined from living material and yet upon this character depends the distinction between many similar and related tulips. Sir Daniel Hall gathers into his book much recent experimental work on the tulip, most of which has been carried out at the John Innes Horticultural Institution of which he was Director. * * * *

"One interesting problem still remains open—the origin of the race of garden tulips which came to western Europe from Turkey about the middle of the sixteenth century but of which no wild source has been traced, either in literature or in nature."

The illustrations in color by H. C. Osterstock are exquisite not only in

their accuracy (in so far as we know the tulips) but in the reproductions that are superb in their delicacy and tenderness of coloring. Beautiful as they are, they do not overshadow the rest of the book.

The amateur gardener may not feel that he is immediately concerned with some of the discussions that are involved. He may feel that he is content to accept the tulips that come safely in their sacks of buckwheat hulls, if indeed they ever come again, but even so he cannot fail to look at his tulips hereafter with the same eye. He cannot fail to see in them not merely tulips with all the wonder of their physical make-up but also the written heritage that is his, across all time and space, by the hand of men and women no longer here who have had a share in the history of the plant as well as in the making of this book. It should serve as an example of the type of work that botanists and gardeners might well combine to accomplish in several genera in our own country.

The Art of Japanese Gardens. Loraine E. Kuck. The John Day Company, New York, 1940. 304 pages, illustrated. \$5.00.

This is a very beautiful book in its physical make-up and presentation. The type is clear and fine, the paper pleasant, the illustrations well produced from the color print that serves as frontispiece through all the half-tones.

"Miss Kuck begins her study of Japanese gardens in China, for the art began there. She pursues it largely in terms of personalities—the emperors, nobles, conquerors, priests, artists and obscure laborers who made the gardens—seeing them always not as dull historic figures, but as vital personages. She also relates the development of gardens to the historical background,

to Oriental religion and philosophy, to the political events which shaped the culture of each period, to the arts in general and to painting, architecture and the tea ceremony in particular." This is as it should be from one point of approach, certainly from the approach indicated in the title, for here we are not concerned with the technique of garden making but rather with the conceptions that materialized in garden making. It is not, therefore, a book that one might take in hand should one attempt the difficult task of constructing a Japanese garden from a book. It is a book, however, that one should study well before he attempted so preposterous a task.

The reviewer is in no position to pass upon the accuracy of her researches nor the wisdom of her reports. Having once seen these gardens for himself, he finds in this book a vivid recollection of the scene, a return of the thoughts that seemed important to him then as a garden designer of another technique who hoped to understand the essence of the new technique. Now as then, there is nothing for him in some of the things that are held precious but that is a lack of his own without doubt. There are also for him, things which are precious that are not here touched upon. That is irrelevant. To any gardener who is willing to read with more than the physical eye, there will come from these pages more than the author has set down, which is what all good books should give.

Epimedium and Vancouveria (Berberidaceae), a Monograph. William Thomas Stearn, F.L.S.

Extracted from The Linnean Society's Journal — Botany. vol. I: (No. 340), 28 Nov. 1938. London, England.

The genus *Epimedium* has provided

the gardener a series of excellent forms for use either in the rock garden or as ground cover plants; the genus *Vancouveria*, although American, is less well known here.

The reason for the problem lies in the fact that epimediums, particularly grown as garden plants, seem to be incorrectly named and much in need of clarification. "To understand the garden plants and to correct their nomenclature it was necessary first to consider them in relation to wild species. This involved a critical study of the literature and herbarium material and of many living plants. This revision of the whole group is the result."

While this is essentially a taxonomist's book, it is easily within the understanding of the amateur gardener who must welcome all such contributions to knowledge. The care with which each has been pursued to its correct determination should be a matter of rejoicing and the uncovering of new species for future cultivation, a matter of delight.

Spring Flora of Missouri. Julian A. Steyermark. The Missouri Botanical Garden and Field Museum of Chicago, 1940. 582 pages, illustrated.

In the preface the author plainly states, "This book is intended for use of everyone interested in plants, particularly the beginner. Its purpose is to acquaint the people of Missouri and surrounding states with the native flowers, which are in bloom on or before June 1." In this the author has succeeded admirably.

The keys which are constructed with this in mind are relatively simple and the descriptive paragraphs are informative but relatively brief. No synonymy is given so that persons having used other floras in the past may arrive at unfamiliar names. The illustrations are

numerous and for the most part clear enough in spite of their great reduction. It should be of great use to local garden clubs and others who take an interest in such matters as well as for the more serious students. For the scientific worker who is concerned with the local flora, it should be invaluable.

The Badianus Manuscript (Codex Barberini, Latin 241), Vatican Library. An Aztec Herbal of 1552. Introduction, Translation and Annotations by Emily Walcott Emmart. The Johns Hopkins Press, Baltimore, 1940. 341 pages, facsimile reproduction in color, \$7.50.

This is a beautiful book. It is more than that—it is a book within a book.

Between pages 85 and 202 are the facsimile color reproductions of the original work, which was written "at the request of Don Francisco de Mendoza and was intended as a gift to "His Holy Caesarian Catholic Royal Majesty" Charles V.

In the pages that lead up to the reproduction Dr. Emmart gives The Description of the Manuscript, The Historical Background of the Manuscript, Illustrations and Symbols, Mythology and Medicine, Modes of Treatment, Materia Medica, Aztec Herb Gardens, each chapter fortified with endless references and cross references.

In the pages that follow the plates are given the transcription of the manuscript and translation of each, together with Dr. Emmart's Comments and Notes.

Throughout the years of preparation Dr. Emmart's prodigious labors have been aided by distinguished scholars and specialists, and encouraged by the interest and means of both institutions and private individuals to whom we owe our gratitude as well.

This reviewer is in no position to judge or to offer judgments. For the

persons of our group who care for books and for the lore of the plant world which is the object of their affection, this manuscript brought to paper in 1552 by two citizens of our own continent, Mexicans, setting forth their own knowledge of their own flora, which has passed through so many hands perhaps, and only now reaches a public as a book, must have a singular appeal.

One wonders what small work of our own time will meet so perfect a resurrection four hundred years hence?

Recent Discoveries in Plant Science as an Amateur Sees Them. W. E. Bott, Lakewood, Ohio. 23 pages. \$.25.

Some experiences in the culture of plants in gravel and in the inducing of mutations by the use of colchicine are related in a rambling, conversational style, plentifully interspersed with philosophical discussions of sundry matters. While a few minor errors of fact may be noted, most of the statements are based on recent experimental work. The author will not be guilty of raising false hopes in the minds of his readers, since the outcome of his own experiments did not develop any excessive enthusiasms. The presentation of this type of information to practical plant growers is truly a difficult task and one at which both journalist and scientist may fail. The measure of success attained by this book will depend upon the background of the individual reader, but probably a more thorough and detailed treatment of fewer subjects would have been preferable.

V. S.

Shrubs in the Garden and Their Legends. Vernon Quinn. The Frederick A. Stokes Company, New York. 1940. 308 pages, decorated. \$2.50.

In this book, more or less like her former books, Mrs. Quinn turns her

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attention to our shrubs. They stand in alphabetical array, azalea, barberry, boxwood, burningbush on to winterberry and include both native shrubs and introduced. When legend and history falter, horticulture is allowed a paragraph or two. It is a pleasant book and beautifully made.

The Home Book of Trees and Shrubs.

J. J. Levison. Simon and Shuster, New York, 1940. 424 pages, illustrated.

Mr. Levison comes to his writing with a background of forestry and apparently with a lively and personal interest in the problems of the amateur and the small home owner. The discussions and the general plan of the book follow the usual, more or less inevitable patterns. The examples, and illustrations of examples, seem in excellent taste. If one is to offer any objections it would be that, although the book is addressed presumably to those with insufficient means to employ all possible professional advice, the illustrations usually show work that is well outside the means of such an average reader.

Flowering Plants and Ferns of Arizona. By T. H. Kearney, R. H. Peebles, and Collaborators.

Few states have a richer and more diversified flora than Arizona. Some 3,000 species of flowering plants and ferns are known to grow there without cultivation, including nearly 150 species that are not known to occur outside the state. Of Cactaceae, alone, there are 77 species, this family being better rep-

resented than in any other state, except possibly Texas.

It is remarkable that no comprehensive account of this most interesting flora has been published hitherto. Unless one has access to a large herbarium and a botanical library, it is extremely difficult to identify Arizona plants with any degree of certainty. It is hoped that the publication here described will make the task easier.

Keys to the families, the general of each family, and the species of each genus are provided. The effort has been made to construct these keys so that they can be used by persons whose technical knowledge of the plants is not extensive. Brief descriptions of the families and genera are given. Under each species there are stated the geographical and altitudinal range within the state, the habitat, and the time of flowering. The general geographical distribution is also given.

For plants of economic importance, notes are provided on the forage, timber, soil-binding, and ornamental value, and the medicinal or poisonous properties. Special attention is given to utilization by the Indians of the state, as food, medicine, etc.

Introductory chapters deal with the history of botanical exploration in Arizona, the geographical relationships of the flora, and the types of vegetation, the last contributed by Dr. Forrest Shreve of the Carnegie Institution of Washington.

Besides the authors whose names appear on the title page, 22 of the leading botanists of the country have contributed treatments of the families and genera in which they specialize. It is recognized that these contributions add greatly to the authority of the work.

The Gardener's Pocketbook

Wurmbea capensis Thunb. [See page 243]

Cape Wurmbea "Swartkoppie" "Kaffertjie"

It is one of the cruelties of botanical science that poor miserable plants should be weighted with hideous names. In an earlier number of this magazine, the charm of botanical names is extolled. In return, a few horrors may be suggested, such as *Schizostylis coccinea*, with its horticultural variety, Mrs. Hegarty for the lovely Kaffir Lilies; *Zaluzianskya villosa*, which designates an attractive garden flower, that exhales much fragrance in the air at night; and here, *Wurmbea*! How could any plant excite interest with such a name? It is quite a nice little plant, too, with star-like, blackish, chocolate-marked flowers in a small spike with nice leaves. We cherish our *Spiranthes cernua*, Ladies' Tresses, even if it is a very little plant. This unfortunate is of the same type, small but rather pretty.

The plant grows from a tunicated corm and there are only three—rarely four—leaves. These are long, lance-shaped, clasping the flower stalk 3-9 inches long. The flowers are set closely along the stalk, forming a spike, the whole 3-9 inches high. The flowers are attractive in shape, tubular or campanulate below, with six widely spreading pointed starry segments. The color is either pale with a purplish-black margin or entirely purplish-black, with two well-defined black glands on the upper surface of the segments. The stamens are inserted at the base of the segments and the anthers are bright yellow and prominent. There is some difference of opinion as to fragrance. Marloth in "The Flora of South Africa" says that there is fragrance.

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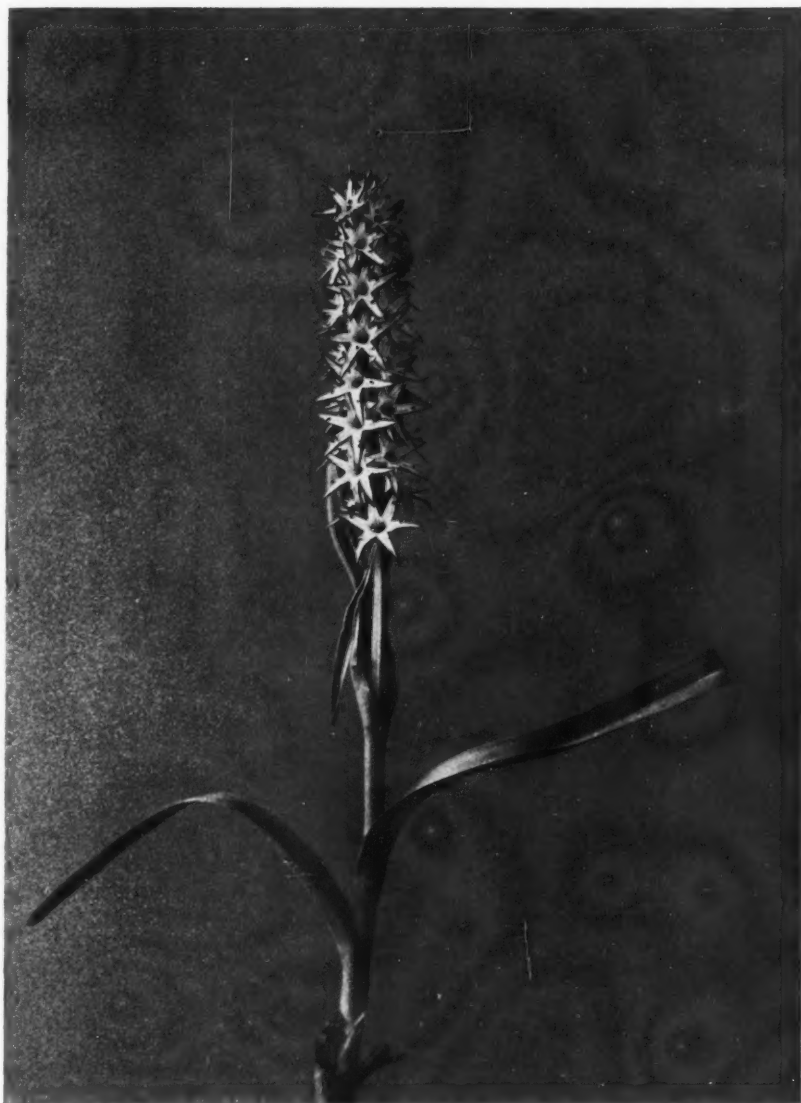
Others say not. This writer found a specimen in the National Park in the Drakensberg Mountains, in an open, sunny valley below the beautiful range called the Mont-aux-Sources. As the flower was not analyzed at the time, it may perhaps have been the closely related *Wurmbea Kraussi*. It had a decided fragrance.

The common names of *Wurmbea capensis* in the Cape Province are given above, the meaning as guessed by the writer, who is not an Afrikaans scholar, being "Black Top" and "Little Kaffir." It is a very common spring flower in the southwest districts of the Cape and was well known by European horticulturists over one hundred years ago.

There are seven species in all, found in Africa and Australia. Two only are native to South Africa, *W. capensis* Thunb. and *W. Kraussi* Baker. The first has quite a wide range, from Natal through the coastal districts, and has been reported in other parts of the country. *W. Kraussi* is found only in the eastern regions. There is some authority for feeling that the genus may be monotypic.

Wurmbea is one of the earliest South African flowers to have been collected and was described by Thunberg in 1781. It appears early in the Botanical Magazine (t. 694, vol. 19) under the name *Melanthium spicata*, the Star-flowered Melanthium. In this, the statement is made that it was found "on the hills."

It would be hardy with us only in warmer regions. It requires the cultivation of ixias, sunlight, light, well-drained soil and a drying after blooming, to duplicate the long, dry summer of its native land. Andrews, in the "Botanists Repository" (1802) says that it flourishes in sandy peat earth



Sarah V. Coombs

[See page 242]

Wurmbea capensis

and flowers in May or June (England). He says that the bulb has a singular appendage at the base "like the pat of a mole." No one else, so far as I have been able to discover, has mentioned this peculiarity.

Its ugly name was given in honor of F. van Wurm, a Dutch merchant at Batavia, who supported the study of Natural History. He should have protested. Poor little *Wurmbea*, innocent victim!

SARAH V. COOMBS

Scarsdale, N. Y.

Brunia nodiflora Linn. [See page 245]
Stompie.

Though the *Brunias* do not belong to the Ericaceae or Heaths but to the Bruniaceae, they have something of the quality of those flowers. They are plants of a country which lacks all-the-year moisture and they have adapted themselves, as the heaths do to their surroundings. Their leaves are small and needle-like, with a hard tip. In *Brunia nodiflora*, they are minute, crowded and closely pressed against the stem.

The Bruniaceae includes about a dozen genera, mostly South African but extending to Australia. The family is placed near the Saxifragaceae.

The plants of *Brunia nodiflora* have a decorative quality with their heads of white flowers in thick clusters and this quality finds recognition in the use of the flowers for house and church decoration, the creamy-white clusters with the prominent stamens having a definite charm. The flower-heads are about the size of a cherry, with many of these heads clustered at the tops of the branches.

The calyx of *Brunia nodiflora* adheres to the ovary, the 5 lobes free and produced beyond it. There are 5 petals, long and spreading, with a long claw,

which bears a 2-celled pouch. The 2-5 stamens are unequal, longer than the petals, with versatile and deeply cleft anthers. The style is almost straight. There is a 2-celled ovary with 2 ovules but there is only one seed.

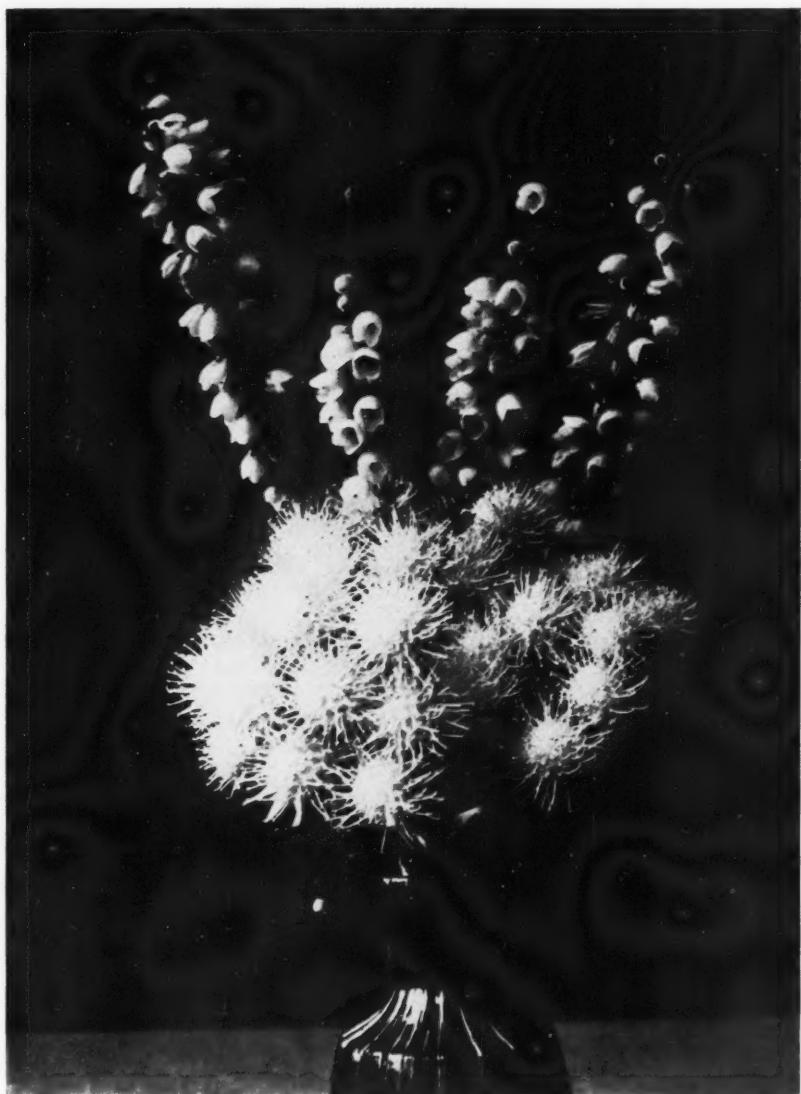
The plant is a shrub 2-3 feet high, with grayish-brown smooth branches. It grows in dry places on high, rocky hillsides, very much the sort of place where our bayberry and sweet-fern grow. Though entirely different in the appearance of the flowers, there is something about *brunias* which reminds one of those other plants. Probably it is only the suggestion given by the hillsides with their strong winds which toughen the fibre of these plants of barren soil. These winds must temper the dryness, since the sea is not far away. The *brunias* are much more striking in appearance than our bayberries.

Though *Brunia nodiflora* (knot-flowered) is not a plant in general cultivation, it was known in English greenhouses in the 19th century. Nicholson in the Illustrated Dictionary of Gardening (1884-5) calls it "an elegant little greenhouse evergreen Heath-like Shrub." "It requires," he says, "a compost of peat and sand, with a little leaf soil added, firm potting and good drainage. Cuttings of young shoots root freely in sand, under a hand light, in summer." It was probably one of the plants which was brought from the Cape of Good Hope in the early 19th Century when, because the greenhouse conditions of that period suited them well, hundreds of beautiful and rare South African flowers flourished.

Erica propendens Andr. [See page 245]

The Pink Drooping-Bell Heath

As the years go by, we are inclined



South African Railways & Harbours

[See page 244]

Erica propendens (upper)
Brunia nodiflora (lower)

to think that all our new inventions are uniformly desirable. We do not always stop to consider the fact that we may, with the new time- or labor-saver, be sacrificing some pleasant older ways. Foods cooked by gas or electricity have not quite the taste of those cooked by coal and surely, the old wood stoves produced subtleties of flavor unknown to their anthracite, electric or gaseous successors.

So the modern greenhouse, with great heat and abundant water, raises wonderful orchids and rare tropical plants but when it took the place of the old kiln-heated house with less heat and not such good arrangements for watering, hundreds of lovely plants took their leave and abandoned their places to the more exotic creatures. Among these departing ones was, unfortunately, the greater part of the South African flowers, which flourished abundantly in the glass-houses of the first half of the 19th century but are now among the rarer flowers. Look at Curtis' Botanical Magazine, Lodiges' Botanical Cabinet and other early books and see what beauties have left us perhaps forever and you will see what I mean and lament their passing. Our hope for these plants now is mostly in sunrooms, "cool" greenhouses, cold pits and heated frames. Sun, fresh air and a cool temperature will bring many of them back to rejoice us as they rejoiced our forbears.

Among the plants which were cultivated abundantly in the old days were the heaths, in wonderful number. There are several hundred of them in South Africa and many of them came to England. The English gardeners were proud of their heaths and when these flowers began to go from the too warm greenhouses, bewailed their departure, often scolding the younger gardeners with bitter contempt for something which was probably not their fault.

Ericas just do not like too much heat.

This picture shows one of this delightful group, *Erica propendens*, the Pink Drooping-Bell Heath. Its rosy flowers on their long stalks are charming. The flowers resemble our own huckleberry blossoms but are larger and far more striking in appearance. Anyone who would like to see what heaths can be should seek the nearest botanical library and ask for the old volumes of "Coloured Engravings of Heaths" or "The Heathery" by H. C. Andrews, in which dozens of these flowers are shown in color.

The pink drooping-bell heath is a delicate little shrub, 1-2 feet high. It is somewhat local in habitat and found in the Caledon District of the Cape Province in South Africa but it was much cultivated in England one hundred or more years ago. The deep rose or pink, bell-shaped flowers have a minute red calyx. The corolla has a downy covering of soft whitish hairs. The flowers are terminal, solitary, in pairs or threes. There are four leaves in a whorl, the leaves short and downy. The branches are spreading.

This heath rarely matures seed in cultivation but is easily propagated by cuttings. The "Revue Horticole" says these should be set in pots filled with sandy soil and placed in winter in a cool greenhouse.

An article in "The Garden" (1892) says that the plants require a liberal amount of water when growing, therefore drainage must be good. The soil for ericas should consist of good fibrous peat chopped up with a spade; the coarseness must be regulated by the size of the pots used. If small pots are used, the soil should be chopped finer but sifted peat should never be used for heaths after they have roots. Firm potting is absolutely necessary. After blooming, the plants should have a "judicious pruning" and a second one



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[See page 248]

Anemone capensis

later. They need much air and in a greenhouse should never stand on a bench heated from below. Too much cold is better than too much heat. Watering should be done thoroughly but carefully to avoid mildew. The plants should be set out of doors as early in spring as possible. Over and over again, one comes on the same cultural directions for heaths: peat, careful watering, much fresh air and sharp pruning.

This plant received a First Class Certificate from the Royal Horticultural Society in 1901.

SARAH V. COOMBS

Scarsdale, N. Y.

Anemone capensis Lam. [See page 247]

Anemone.

This flower is one of South Africa's protected treasures, so rare, alas! and so resistant to cultivation that it is not likely to be found except in its own haunts. However, it has been cultivated in England in the past and might be grown here if—and it is a large if—one could get seeds.

It is a flower of great beauty, the soft delicate pale pink silkiness of its recurving petal-like sepals, deepening on the back to crimson, in contrast with bright golden anthers, as well as its attractive leaves, making it one of the best-beloved flowers of its native land. In rainy weather and at night, the flowers close and droop but in sunshine they open wide and stand upright. They are found, Marloth says, on the southwest mountains of the Cape Province, where the southern winds bring sufficient moisture even in summer. They are not found on the plains and do not flourish even in the gardens of the Cape. In "Plants and Their Ways in South Africa" (Stoneman, 1906), the Cape Anemone is said to be abundant on shady, grass-covered mountain slopes (in the Cape Province).

The plant grows from a deep, stout rootstock, which produces one or more shoots each year. In "A Book of South African Flowers" by Barclay-Bolus-Steer, it is said to be a perennial evergreen and low growing but with a root which goes deep below the ground so that it survives better than many flowers the rather frequent veld fires. The leaves have a thick cuticle over their surface which helps them to resist the drying effect of the wind. These leaves are handsome, often measuring 6-9 inches across, the petioles soft and hairy. "A few inches below the flower there is usually a sheathing leaf of which the green portion is much reduced. In the sheath the tender flower-bud was protected and from its axil another peduncle may branch, also bearing a solitary flower." The flower stalk is 2 feet high. The flower has a tendency to double. The leaf stem is short, 6-8 inches, and densely leafy, the leaflets are wedge-shaped, thrice-cut, the middle one elongated, the segments generally 3-toothed. Fruits are a bunch of dry tailed achenes.

Anemone capensis belongs to the buttercup family, Ranunculaceae. It was first placed in the Genus *Atragene* by Linnaeus but transferred later to its present place. The flower is suggestive of the Pasque-flower, *Anemone pulsatilla*, and has been called *Pulsatilla africana* as well as *Atragene capensis* and *Clematis capensis*.

Those people lucky enough to have been able to raise it in England after its introduction in 1795 say that "it requires a dry stove to preserve it, suffering much from damp" (Bot. Rep. 1916 as *Atragene*). Propagation appears to be possible only by seeds. "The soil it prefers is a mixture of peat and loam; flowers about March or April" (England).

Mrs. Loudon in "The Ladies' Flower-Garden of Ornamental Greenhouse

Plants" (1848) says that "it requires to be kept in a warm, dry situation, without water during its season of repose, and to have abundance of water while it is in a growing state." She speaks of the variability of its flowers, which are sometimes very double and sometimes scarcely so at all and are sometimes more or less tinged with pink and sometimes pure white. If we could only get some seeds!

SARAH V. COOMBS

Scarsdale, N. Y.

Spathodea campanulata again.

Plant names are intriguing and though *Spathodea* or Tulip Tree or even Fountain Tree awoke no response in this writer's mind, one common name did start a hunt which finally was rewarded by finding a beautiful specimen of this tree in full bloom in the Botanical Garden in Durban, Province of Natal, South Africa. "Flame-of-the-forest." One would go far to seek a tree with such a name and it deserved all its glory, covered with its clusters of great crimson-scarlet flowers. It is a tree of Tropical Africa but Natal, while not in that region, has what seems like a long arm of tropical vegetation thrust down from the equatorial lands so that many plants will grow there which normally are not found more than a few degrees away from the central zone. The shorter name, Flame Tree, applied to *Spathodea* sometimes, is given also to *Sterculia acerifolia* of Australia. Both of these trees have been planted in southern Florida and California and *Spathodea* is said to seed itself so freely in Cuba that it may possibly become a nuisance. That would be a sad fate for so lovely a tree.

The reference to Professor Lindley, mentioned in the note on *Spathodea* in the January, 1940, number of this magazine, is found in Paxton's Flower

Garden, vol. 3, 1853. He says: "It has a fine ash-like habit, producing great opposite pinnate leaves, with broad leaflets, from among which come the glorious racemes of Tulip-like tough leathery fiery-orange flowers, six or seven together. "The sub-title of his description is "The Bell-Flowered Spathodea. A magnificent Hothouse Shrub from Tropical Africa, belonging to the Natural Order of Bignoniads."

In the "Flore des Serres," vol. 8, 1852-53, it is said to flourish under glass in a "Stove" temperature, in rich soil, very well drained. Water should be given less abundantly toward the flowering period and proportioned to the growth of the plant.

The fruit is shown as long and pod-like, with a 2-celled ovary, in "The Journal of Botany—British and Foreign, vol. 3, 1865. Franz Thonner, in "The Flowering Plants of Africa," says that the seeds have a broad wing and that the trees "yield timber, edible seeds and medicaments, and serve as ornamental plants." Thonner is quoted by Bentham in "Niger Flora" as saying that the flowers are as large as the largest tulips.

In "Useful Plants of West Tropical Africa" by J. Hutchinson and J. M. Dalziel, 1937, the authors state that the wood is used for blacksmiths' bellows and drums and that the bark or a black decoction (sometimes made from the leaves) is used as a lotion. Bark, leaves or flowers are used as remedies for skin diseases and for some serious internal disorders. The name Fountain Tree probably came from the fact that the calyx in bud holds a sweet watery fluid which children playfully squirt into each other's eyes. The story stops there and does not tell what the result is to the poor victim. The *Spathodea* tree is regarded in some sections of Africa with superstitious

awe and is called the "bâton du sorcier." Where it flourishes, the soil is considered good for plantations. There is a long list of native names, sure sign of a prominent or well-known plant.

SARAH V. COOMBS

Scarsdale, N. Y.

Ficus Roxburghii Wall. [See page 251]

For years there have been introductions into Florida of various species of *Ficus*—a genus known best to all of us as including the edible fig (*Ficus carica*) and the Rubber Plant (*Ficus elastica*). Some have become familiar trees in parts of Florida and favorites in those places where they have decent room to develop. As so often happens in new plantings, both trees and shrubs are placed where they cannot possibly develop well and this for a good *ficus* is particularly unfortunate, as it brings them into special disrepute.

The species of our present note is not one that has had much publicity in Florida chiefly because it has been difficult to root and stock plants have been few. It is, however, a species that Doctor Fairchild has always given an ecstatic boost. He had a brief paper about it in the *Journal of Heredity* (Vol. XVIII, No. 12—pp. 533-536, Dec., 1927) in which he discusses the specimen he saw at the Botanic Garden at Orotava, Teneriffe, an incident upon which he touches in his book *Exploring for Plants* (pp. 200-202) but in each case the story is turned about the astonishing fruits which are borne on "shortened leafless branches on the larger branches or stems" [King, *Annals of Royal Bot. Gard., Calcutta.*, Vol. 1, p. 168 (1888)] and his regret that they were not edible. Apparently the fig wasp that accomplishes the fertilization has not been introduced to Teneriffe, just as it has not been to Florida. There is a good picture of

this tree in the Kew Bulletin of Miscellaneous Information, No. 8, p. 289; 1918.

A much older reporter had admired this tree before Doctor Fairchild, for the tree is well illustrated in an article in *Revue Horticole* for 1890 (p. 81), where it illustrates an article "Notes sur Quelques Ficus du Jardin du Hamma" by Maurice L. de Vilmorin. This garden near Algiers seems to have had a good collection and the illustration shows excellent specimens that line one of the principal avenues of the garden and terminate in a "rond-point" or plaza with a circular pool.

Some attempts have been considered for Florida but the process would be too difficult as it would involve several quarantine stops and the rearing of new wasps at places where there might be no hosts.

Florida, therefore, must be content with a tree that has some claim to beauty for itself, even if it should not ever produce fruits. Curiously enough, little has ever been said about this character of the plant. The picture of the Florida plant, published by Doctor Fairchild in 1927 (l.c.), is certainly not attractive, but the plant apparently was planted in a jungle of other material like so much of the earliest material sent to plant lovers. The photograph herewith was taken of a much younger plant in the grounds of the U. S. Plant Introduction Garden where it had room to keep all of its leaves to the ground.

In Doctor King's article, already cited, it is pointed out that this species is a "tree from 10 to 30 ft. high, with wide-spreading head ****." Since all *ficus* species are amenable to pruning, it seems not unlikely that as an ornamental our species might be kept well within bounds.

To me as a newcomer, this species made particular appeal since it had leaves of such great size and of such



Michael Carron

[See page 250]

Ficus Roxburghii

beautiful coloring. There is a plethora of those species with dark green leathery leaves like our northern home-grown *F. clastica* and of those sorts with rough figlike leaves, and it may be that there are others that would rival this.

Although King says the leaves at most are only 12 by 15 inches, these seem much larger in memory. The veins are deeply sunk and make a leaf surface that catches the play of light and shade. The young leaves are usually tinted with tender pink and bronze and are often silky-hairy, which also catches the light. As they mature, the color becomes plain green and the silky down disappears, leaving a more or less harsh leaf, as one might expect.

King gives the native range as "outer ranges of the Himalayas, from the Indus to Bhotan (but rare in the western Himalaya); Assam and Khasi Hills; Chittagong and Burmese Hills at elevation from 1,000 to 5,000 feet," which makes it not one of the most tropical of figs.

This monograph, which is hard enough reading at best, is enlivened by a complete series of lithographic drawings—91 plates in the first part (folio size) and 138 in the second part. Some of the plates are not signed; most are by Gopal Chandra Das (some plates Dass); M. Smith and Aghore Lal Singh supply about the same number each and a few are by S. Abdool Mullah. All intrigue one's interest in this amazing group of plants, some of which must be excellent and some rather indifferent as such plants go.

Nymphaea colorata A. Peter

In the Missouri Botanical Garden Bulletin (June, 1940, p. 114-115) Mr. G. H. Pring has an interesting note and an engaging picture of this little-known water-lily. The plants at the Garden came from Kew in March,

1928, which institution had them from Africa. A fine color plate of this species was shown in Curtis Botanical Magazine.

Before that the original reference in A. Peter's "Wasserpflanzen und Sumpfgewächse in Deutsch-Ostafrika" (1928) was the chief source of information. This paper, which deals with many genera, has 25 pages (55-79) devoted to nymphaeas. To anyone who is interested in tropical nymphaeas, the description of 10 new species, *Nymphaea holoxantha*, *citrina* (each yellow), *sphaerantha*, *polychroma*, *colorata*, *purpurascens*, *grandiflora*, *leucantha*, *hypotricha* and *acutidens* (all in the blue purple series), makes this publication a very exciting document. Whether or not all of these names survive the attentions of the taxonomists it is to be hoped that all these plants as well as plants of the other species native to East Africa and not now in cultivation, will reach our gardens.

For *N. holoxantha* the color description may be translated "all parts of the flower are yellow, the inner petals deeper than the outer petals, tending more toward orange." For *N. citrina* the description is "lemon yellow."

N. sphaerantha is merely "blue" (blau); *polychroma* light blue, light lilac; *purpurascens* light blue, yellowish at base; *grandiflora* lilac blue, *leucantha* milky white, the outermost more or less washed and striped with pinkish lilac; *hypotricha* pale blue; *acutidens* pale blue.

In Herr Peter's text *N. colorata* stands next to *N. Zanzibarensis* and the illustration in Mr. Pring's article, particularly the arrangement of the stamens, suggests this relationship and his descriptive notes recall the plant flowered here last year as Francis Griffith. That variety was viviparous, but nothing is said about this for the present species.

Prunus gracilis [See page 254]

Each spring season all admirers of blossoming trees look forward to the enchantingly lovely white flowers that are displayed by our native plums. *Prunus gracilis* has all the beauty and attractiveness of its tribe and it is perhaps the best one to use in a rock garden, as it is a very dwarf grower and can be kept as a miniature tree.

It makes a wholly delightful picture when in bloom and never seems to have an "off season." In autumn the small red fruits generously produced are pretty to look at and they make a very pleasing jelly.

Like most plums, it does have an invasive habit of growth, so that it should not be placed too close to precious or fragile plants. Every now and then it thrusts upward a small shoot which in another season becomes a tiny tree. When these become too large they are pulled out. Treated thus there are always a few blooming-sized little trees and a few young ones coming along. Their growth is picturesque and informal.

In their native home on the prairies they are able to recover quickly after the devastating effect of a fire and soon afterward this brave little tree is again adorning the "spot under the sun" to which it is allotted.

This little *Prunus* came to me from Oklahoma about twelve years ago and it has made itself thoroughly at home on the outskirts of my rock garden. It has been tried in other situations and in every instance it has thrived. Its ability to stand extreme drought and arid conditions enables it to grow happily in the driest and poorest banks where few ornamental trees or shrubs could grow. In fact, it blooms most freely under these conditions. In rich soil or with moisture, it would of course attain greater dimensions and lose much of its grace and attractiveness.

Their rigid thorny habit makes them excellent plants to place along a property boundary line or for use as an informal hedge or fence. For informal ornamental planting in front of tall evergreens or among dwarf ones, it is outstanding. At Gladwyne it grows among rocks with dwarf pines and prostrate junipers and they make a fair sight in spring. Mine remain small or I keep them so and never let them pass two or three feet. No matter how they are used, however, their interesting and picturesque habit of growth, their light and feathery blooms poised so airily on the dark branches make them the loveliest of small trees.

MARY G. HENRY

Gladwyne, Pa.

Bloodroot.

I think that we are fully as fond of our native bloodroot as of any of the early spring flowers. And I have an idea that to us, who can have no flowers out-of-doors during the winter, the first crocus gives much more of a thrill than to those who live farther south.

The bloodroot, *Sanguinaria canadensis*, is two or three weeks later than the crocus, May 1 this year, and since it is coincident with *Hepatica*, *Chionodoxa* and *Scilla sibirica*, its whiteness makes a delightful foil for their prevailing blues.

The flower bud appears, entirely folded around by a leaf, just these two stems from the bud in the rootstock. The flower buds grow faster than the leaves, so that in a group, by the time they are ready to open, there is nothing to mar the sheet of snowy, golden-hearted whiteness. After the petals fall, the leaves continue to grow, both in height and breadth, hiding the seed-pods, and making an attractive mass of foliage until midsummer, when they die away.

The bloodroot belongs to the poppy



Claude Hope

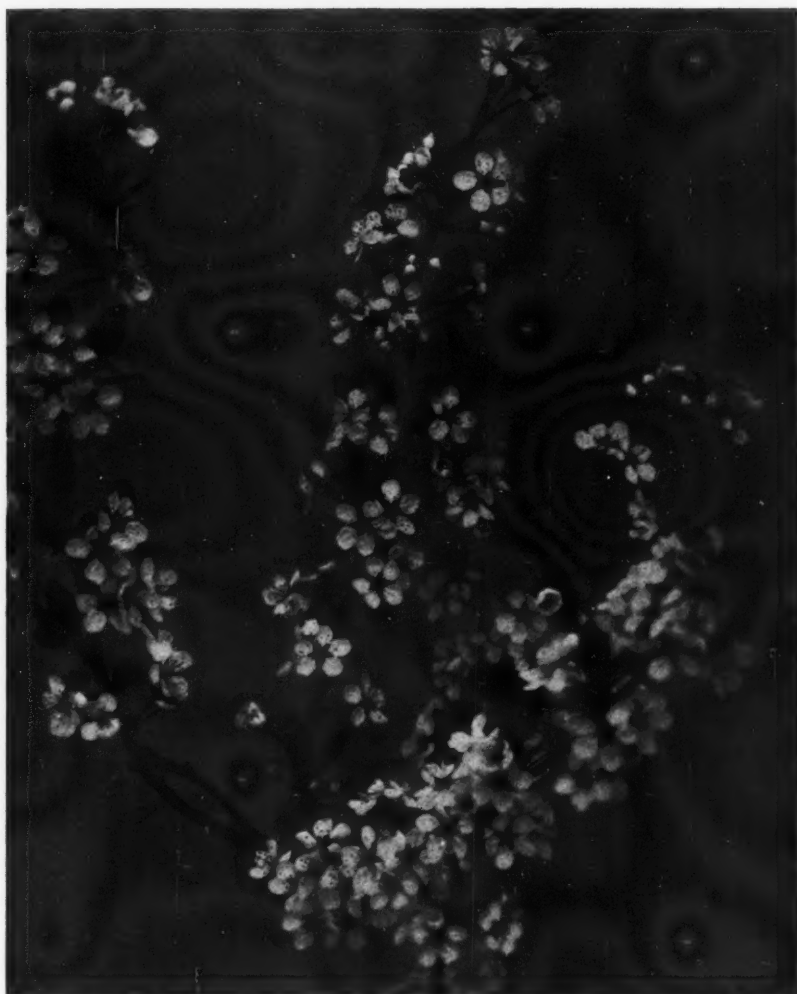
[See page 253]

Prunus gracilis

family, and gets its name from the reddish juice which oozes from any part of the plant when cut, especially the rootstock, which is of about finger thickness. It is said that the Indians used the juice for warpaint, whence its name of Indian-paint. It is also called red puccoon. It is native to practi-

cally all of the eastern part of this country.

The flower stalks are six or eight inches tall. There is a two-parted calyx which drops as the flowers open. The petals are eight to twelve in number, pointed, glistening white, opening flat in the day-time, but partly closing at

*Walter B. Wilder*

[See page 256]

Prunus pumila

night. The whole starry flower is about an inch and a half across. The leaves reach a height of ten or twelve inches, and a breadth of seven inches or more. They are rounding, and cut into about seven rounded lobes.

The bloodroot's only drawback is its rather short season of bloom, lasting at most two weeks, and more often only ten days. Still, like many flowers, the season may easily be prolonged by planting it in different situations. The

first planting here was on the north side of a wall, but some that jumped the wall and settled themselves cosily at the bases of two or three of the neighbor's apple trees, and against the south side of the wall, bloom several days earlier.

Bloodroot likes a woody soil, and grows naturally in places that are open to the sun in the early spring, and partially shaded by foliage of trees or shrubs later in the season. But it will grow almost anywhere, and requires no care at all. It increases by root and by seed, and may be divided or moved at any time.

In the United States Dispensatory of 1847, it is stated that "*Sanguinaria canadensis* is an acrid emetic, with stimulant and narcotic powers." "Four persons lost their lives at Bellevue Hospital, N. Y., in consequence of drinking largely of tincture of bloodroot, which they mistook for ardent spirits." But children have always delighted to pick it, and we have never heard of anyone's being injured by it in the least, so that it probably will not hurt anyone unless he follows the example of the four at Bellevue!

A powder from the root is still used somewhat as a medicine for the blood, but as it is lastingly acrid and nauseating, perhaps most of us are as well satisfied to have it in the limbo of forgotten things.

We hear sometimes of a double bloodroot. The first one was found some two hundred years ago, but it has been developed until it is "so double as to be almost globular." And does my memory deceive me, or have I read in some English garden book of a pink one?

But neither the double nor the problematical pink one could rob the ordinary bloodroot of its place as a lovely

and thoroughly worthwhile flower for the spring garden.

RACHAEL CAUGHEY
Antrim, N. H.

Prunus pumila [See page 255]

With few exceptions, when ornamental apples or cherries are grown, gardeners select Asiatic and not the native species. To be sure, the exotics have more conspicuous flowers but some of the natives have a delicious perfume and quite a few pleasantly edible fruits.

A native plum delightful to grow because of its fragrance, of fruit and spice, its white fluffy bloom and low stature, is *Prunus pumila*, the sand cherry. The shrub is distributed from Western New York, westward to Wisconsin and Illinois and as would be expected is exceedingly hardy.

In early May when the leaves are not fully out, the low spreading shrub has its branches crowded with white blossoms, less than $\frac{1}{2}$ " across. The branches are dark, plum-brown, with many lines on them. The foliage expands after the flowers have faded and is so attractive it makes the shrub ornamental all summer. The leaves stand up almost perpendicular to the earth and show their grey-green under-surfaces. The upper surface is glossy and olive-green. The leaves are narrow, widest at the center, pointed at either end, and faintly and crenately toothed. The under surface is not hairy and the greyness is caused by a waxy, glaucous covering. The largest leaves measure 2" in length and $1\frac{3}{4}$ " across. The stalk is $\frac{1}{4}$ " long and on either side of it two slender stipules rise up straight. Two to three flowers start from the same point and grow along the whole length of the branches, flowering on old wood. The calyx has five rounded sepal lobes and is tinted salmon on the inside. The petals do not overlap or

touch and have uneven margins. They are widest at the tip and narrow to a tiny claw. Numerous stamens of uneven lengths, their white filaments tipped with round anthers like yellow dots, fill the heart of the blossoms.

The fruit is small, purple-black, lustrous and scarcely edible, says Dr. Rehder. My shrubs have not fruited as yet.

HELEN M. FOX
Peckskill, N. Y.

Good Garden Peonies from Seed

Eight years ago, ten seeds from each of ten types of Japanese peonies obtained from the Chugai Nursery, Japan, were planted in Central Vermont. Sixty-two germinated and came up the second year. These plants were more vigorous than our usual peony seedlings.

The plants blossomed the seventh year. Thirty-one were true Japanese type. From the tall vigorous type with blossoms resembling "Tokio," to small plants with delicate ruffled flowers, all our usual types appeared, except deep true reds. The five reds were rose red or deep rose pink. They were beautifully cupped and free flowering.

The five whites were interesting and attractive. The foliage was modified "Isami Jishi" type, with stiffer stems. There were no two alike. Some had loose crêpey petals; others were more formal.

The pinks ranged from coarse eight-inch flowers on tall plants with coarse crinkled foliage to five-inch flowers on plants with small dark green leathery foliage.

None of the flowers feathered.

From three dollars' worth of seed one obtained thirty-one good Japanese peonies and added great zest to gardening.

MARY E. G. FREEBORN
Proctor, Vermont

From the Midwest Horticultural Society:

Kalopanax pictus [See page 259]

On the campus of the University of Illinois is an ornamental tree of striking subtropical effect, *Kalopanax pictus*, whose common name is castor aralia according to Standardized Plant Names. Although it reaches a height of 80 feet in its native home in Japan, it probably will not exceed 25 feet in the Middle West. The castor aralia is a formidable tree with numerous stout spines along the trunk and branches. There would not be much fun for the youngsters in climbing this tree. Its large leaves are palmately lobed in contrast to the other species of the genus which are digitate. They are dark green above, light green beneath and usually slightly hairy when young, borne on long petioles six to eighteen inches long. The leaves are five to seven-lobed and grow a foot or more in diameter! The variety *Maximowiczii* is listed by some firms. It differs from the species in having more deeply cut lobes, oblong-lanceolate instead of triangular-ovate. The latter part of July white flowers appear at the end of the branches in a flat compound cluster and are followed by small black fruits.

No other tree that can be grown in this area has quite the effect of the castor aralia. No special soil requirements are necessary, although it is said to prefer a moist situation.

Neviusia alabamensis

A shrub bearing ornamental flowers without petals is the unusual feature of *Neviusia alabamensis*, commonly called snow-wreath. I hardly expected this shrub to survive the winters here since it is a native of Alabama, but it came through last winter with no injury whatever, although it was 18 to 20 de-

greens below zero. The plant belongs to the Rosaceae, and is closely allied to the genus *Kerria*, but differs in being devoid of petals.

The flowers are white, about an inch in diameter, and are produced in clusters on short axillary growths, which are developed from the ripened wood of the previous year's growth. The feature of the flowers is the numerous long, white stamens, which impart to the plant a pretty feathery effect. The leaves are loosely disposed along the slender branches, and are from 1 to 3 inches long, $\frac{1}{2}$ to $1\frac{1}{2}$ inches broad, ovate or elliptic ovate, doubly serrate.

The snow-wreath is easily propagated by cuttings or division. A loose, well drained soil, and a sheltered position are probably the reasons why it survived here. *Neviusia* is rarely listed in the nursery trade.

Pseudolarix Kaempferi

Among the ornamental trees valuable for handsome feathery foliage is the golden larch, *Pseudolarix Kaempferi*. It is a beautiful tree with its long, spreading branches pendulous at the ends, bearing light green foliage, which turns to a clear yellow in autumn. For that matter any of the larches provide an interesting contrast to the foliage of our broad leaved trees.

The tree is a native of eastern China, another one of Robert Fortune's introductions, and is the only species left of a genus numerous in prehistoric ages. Under good conditions it will make a magnificent specimen 50 feet or more in height, although it attains a much greater height in its native home.

Pseudolarix as well as *Larix* are deciduous conifers, dropping their needles during October. Even after the leaves have fallen the tree has a characteristic grace that renders it attractive through the winter, the drooping branches be-

ing studded along their sides by short projections, as well as here and there by the interesting cones.

The differences between *Pseudolarix* and *Larix* are only technical in character. *Pseudolarix* has pointed bud scales and clustered male flowers; the cones are not so globular and the cone scales are shed when the cone is ripe. Furthermore, the leaves are wider than larches. A larch has blunt bud scales, the male flowers are solitary, the cones are globular and their scales are persistent. The bark of golden larch is reddish brown and breaks into narrow scales while the twigs are yellowish brown.

The best situation for the tree would be in sandy, slightly acid soil, in a sunny spot. It seems to be remarkably free from fungus diseases and insect pests.

× *Lonicera Tellmanniana*

One of the newest climbers to appear in the trade is × *Lonicera Tellmanniana*. It was raised at Budapest about 1920, a hybrid between *L. tragophylla* and *L. sempervirens*. The vine is of vigorous growth, exceeding most of the other honeysuckles, its oval leaves being about 3 inches long, the upper pair united into a collar clasping the stem.

The flowers appear in June and July in terminal-stalked clusters of 8 to 12; they are yellow, two inches long and up to an inch wide across the lips. They are tipped with red so that the plant is very conspicuous in bloom.

This outstanding climber flourishes in full sun in a good loamy soil moderately well drained, but is also tolerant of half shade. Its fragrance is somewhat less than many of the wild honeysuckles, but is quite noticeable in early morning.

ROBERT VAN TRESS
Garfield Park, Chicago, Ill.



Arnold Arboretum

[See page 257]

Kalopanax pictus
"Castor Aralia"

Neviusia alabamensis A. Gray [See page 261]

Through the courtesy of Mrs. J. Norman Henry, there is a flourishing bush of this rare American native shrub on our green hill which is certainly many hundred miles north of its solitary home in Alabama. So far no damage from cold has ever shown itself.

The soil is rich and moist enough in spring but usually dries out more than well in midsummer, but nothing seems to affect the freshness of its prettily serrate leaves. These, as has been pointed out elsewhere, resemble those of *Stephenandra*, itself a not too common oriental shrub. In May the whole bush is covered over with the appearance of white fluff from the blossoms with their conspicuous pompons of stamens, the same sort of effect one gets in a good meadow-rue.

It is a plant not often met with and yet among American plants it has a considerable literary and botanical history.

In that marvellous work, Curtis's Botanical Magazine, which will forever memorialize the British love of plants and zeal for getting them home, there is a plate of this species (t. 6806) with the date 1885 and the note of J. D. H(ooker) "*Neviusia* flowered at Kew in May 1883; the plant was nailed against a wall exposed to the East, and presented a very beautiful appearance with its snow-white feathery blossoms. Considering the climate and position of its native country, I should doubt its being hardy. It has been received at Kew from several contributors, notably a living plant from Professor Sargent, of Cambridge, U. S. A., in 1879, and another from F. Miles, Esq., in 1881, the flowers of which plant are here figured.*****"

The actual discovery of the plant was accomplished much earlier. In

"Plant Life in Alabama" by Charles Mohr are several bits that should be copied here.

On page 17—"The Rev. R. D. Nevius collected plants in 1853-54 in the vicinity of Tuscaloosa. He is the discoverer of the singular shrub *Neviusia*, named in his honor by Gray, which is confined to a single locality on the banks of the Alabama River." On page 35, "If we regard these plants as slightly modified descendants of types belonging to an ancient flora, which have survived the changes that our globe has undergone and have found a refuge in their present localities, the mystery of their strange isolation finds a satisfactory solution. The confinement to a single spot on the Warrior of *Neviusia alabamensis*, with its nearest relation in Japan, **** can be accounted for on the same ground." On page 91, "On the cliffs of sandstone which form the eastern brink of the Black Warrior River, a short distance from the city of Tuscaloosa, a monotypical shrub, *Neviusia alabamensis*, finds its only home. The numerous slender, wand-like stems bear abundant white apetalous flowers in the earliest days of spring when the leaves begin to appear. This unique shrub belongs to the Asiatic element of Alabama's flora, and is strictly confined to the above locality. It was discovered by the Rev. R. A. Nevius and Prof. Wyman in 1858." [Note the discrepancies. Ed.]

One wonders if the ever active garden clubs will take it under their wing and make a mass planting that would be much more suitable to Alabama than the azaleas of the advertisements!

In the Gardener's Chronicle (London, Ser. III, XXXV, 229 (1904)) there is a pleasant note and the advice "freely propagated by cuttings." Since it produces some suckers that are easily separated from the parent crown that



Claude Hope

[See page 260]

Neviusia alabamensis

process is also available. In a later issue of the same magazine (Ser. III, XL, 40, 44 (1909) there is a note and plate to show how well the shrub grows and comes into flower in the "temperate house." From the picture one would guess that the leaves were slower to develop under such treatment than normally.

Doubtless like many another good shrub, this will always be a secondary matter but for the place large enough to admit of such plants or for the gardener who cares for diversity of interest rather than mere display, this is a nice shrub.

B. Y. M.

Neviusia alabamensis [See page 261]

In beauty, rarity and interest *Neviusia alabamensis* stands high among American shrubs. In fact, to my mind, it can "hold its own" among the finest shrubs from all over the world.

Owing to its great scarcity in its native home, it remained unseen for many years. About the middle of the last century it was found by Rev. R. D. Nevius on sandstone cliffs near Tuscaloosa, Alabama. It is indeed so very restricted in its range that it is undoubtedly one of the rare plants of the world, and surely when it is well grown, it is one of the most daintily beautiful.

It has been thriving at Gladwyne for 12 years and without special attention care or protection of any kind, it has withstood the vicissitudes of our most rigorous winters. It bloomed this spring as freely as ever after record-breaking cold weather.

This exquisite shrub is related to the Spiraea Tribe and resembles some of the smaller sized types of this family in foliage and growth. In Dr. Rehder's big "Manual" its height is given as one-two meters, but with me, in several situations, it has not exceeded one meter.

Its marvellous flowers like white fluffy balls of fringe are entirely without petals and are composed solely of a quantity of comparatively long stamens. They are produced lavishly toward the extremities of the branches, creating a most unusual and delightful effect. There is only one species of *Neviusia* and it is familiarly known as "snow wreath," a name which seems appropriate, as the blossoms are as light and fragile as snowflakes.

The demands that *Neviusia* makes for its well-being are few, but there are certain requirements that are necessary in order to maintain it in a thriving condition. It seems to crave warmth and in order to bloom freely it must have a poor soil that is well-drained in all seasons. It should be kept dry in summer and never watered. In rich soils or in ground that is tenacious of moisture, *Neviusia* loses so much of its beauty and grace that it is just one more shrub.

As its home is in a limestone section of the country, a calcareous soil seems indicated for its best well-being. A fair measure of success, however, may be obtained in this latitude by growing in a well-drained soil that is neutral in reaction.

Let all who desire to grow beautiful shrubs that are not common try this one. The fact that it is one of our rare and precious natives should make an excellent reason to want to have it for its interest alone, even if it were not half so attractive. The added facts that it is easy to grow and a very, very charming subject should encourage most garden-minded people to try it.

MARY G. HENRY.

Gladwyne, Pa.

Habranthus robustus Herbert. [See page 263]

Until recently most of us would have called this plant a zephyranthes; per-



Claude Hope

[See page 262]

Habranthus robustus

haps few of us are familiar with the genus *Habranthus* Herbert. Certainly between Dean Herbert and Dr. J. G. Baker, the genus had been pretty well obscured. Recently, however, in the *Journal of the Royal Horticultural Society* (v. 62, p. 195), Sealy re-examined the entire group of plants of the *Amaryllidaceae* included by Baker in the genera *Hippeastrum* and *Zephyranthes*, and came to the conclusion that the genera *Pyrolirion* and *Habranthus* deserved recognition. As the groups appear to be distinct enough, and the differences of sufficient magnitude, there seems to be an advantage in accepting his views.

Perhaps a resumé of the distinctions Sealy made between the four genera will not be amiss.

I. Stamens erect, regularly arranged. Peduncle always one flowered; flowers erect; perianth segments sub-equal.

A. Stamens in two sets of three each, the three longer alternating with the three shorter. Bracts usually none. Perianth tube short, broad. Spathe tubular below; free above, usually unilateral and bifid but sometimes only partially split along back, and occasionally entire.

Zephyranthes

B. Stamens subequal. Bracts none. Perianth tube long, narrow. Spathe tubular and sheathing below; with two free opposite segments above.

Pyrolirion

II. Stamens declinate, fasciculate, unequal, of four lengths. Flowers declinate; perianth segments unequal, of four sizes, sometimes sub-equal in *Habranthus*.

A. Spathe as in *Zephyranthes*. Peduncle usually one flowered, sometimes two flowered, rare-

ly up to four flowered. Bracts sometimes absent.

Habranthus

B. Spathe of two equal and opposite valves which are simple and quite free from one another to the base. Peduncle two to several flowered, rarely one flowered by reduction. Bracts always present. Perianth tube of various lengths.

Hippeastrum

Habranthus robustus was first described by Herbert in Sweet's *Hortus Britannicus* ed. II, p. 506 (1830) from plants imported by J. B. Mackay from Buenos Aires in 1827. The evidence, however, indicates that the plant came from Uruguay. To this day its native home is not known beyond doubt. Later, in 1892, the Royal Botanic Gardens at Kew received a package of seeds labeled *Hippeastrum brachyandrum* from a Mr. Bartholomew, who received the parent stock from a friend in Buenos Aires. This lot of seeds produced plants which Doctor Stapf was able to identify as Herbert's *Habranthus robustus*. A beautiful color plate of this plant was published as t. 9126 in Curtis's *Botanical Magazine* (Vol. 152, 1926; issued 1927).

Like so many of its group, our plant has been shunted about among the genera *Hippeastrum*, *Habranthus* and *Zephyranthes*. Baker apparently could not decide which genus he preferred, for at one time he called it *Hippeastrum tubispathum* (*Journal of Botany* 16, p. 82, 1878) and at another time *Zephyranthes robusta* (Herbert) Baker in the *Handbook of the Amaryllideae* p. 35, 1888. In the discussion accompanying t. 9126 (l.c.) Stapf concluded that *Habranthus* deserved to be restored. In this connection, it is interesting to note that Van Tubergen, Ltd., whence our present plant came, list the bulbs under

both names, *H. robustus* and *Zephyranthes robusta*, without indicating their identity.

The showy flowers remind one somewhat of *Zephyranthes grandiflora* Lind. (*Z. carinata* Herb.), but the color, soft lilac pink, has more blue in it, and the flowers are declined rather than erect. They measure about three inches across, and the segments are about three inches long. The three outer segments are a little broader than the inner ones, and all are acute. The flowers are always solitary on peduncles about 10 to 12 inches tall. The pedicel is about $2\frac{1}{2}$ to 3 inches long, and is enclosed in the lower half by the tubular spathe. Flowers are produced repeatedly by the same bulb for a considerable period in midsummer. Bulbs that have been permitted to form clumps from offsets which are formed very readily produce very impressive masses of flowers. The individual flower lasts only two days, or at best three days, but the succession of flowers makes the clumps very presentable.

The linear, rich green leaves usually number 3 to 5. They are characteristically arched over in the upper half. The long-necked bulbs are somewhat elongate-globose, about $1\frac{1}{2}$ to 2 inches in diameter, and are covered with nut-brown papery coats.

The plants may be grown quite satisfactorily in northern gardens by storing in sand over winter. For those who are willing to attend to this matter, there will be a splendid show of flowers throughout July and August. If the bed contains many bulbs, there will be scarcely a day without several flowers. Those who live in the lower South will have no trouble in supplying its needs. They will tolerate some frost in England.

Their propagation is very simple. Offsets are produced abundantly, and seed is produced freely, requiring only

about a month to mature. If it is desired to grow them from seed, it is necessary to make the sowings within a few weeks after maturity. The seeds germinate promptly and the seedlings grow off vigorously.

Cyrilla racemiflora L. [See page 267]

Among the many native shrubs of the Southeastern States that move in and out of horticultural literature much more than they appear to do in and out of gardens is the subject of this note, which has been mentioned before this in this magazine. There are two specimens in the writer's gardens, each from North Carolina but not from the wild. The one plant flourishes on the back of a rhododendron bed in company with various fothergillas and other southeastern shrubs; the other, which started off well, now looks less likely, possibly for lack of soil moisture, possibly for lack of sunlight.

Each July one notices the flowering which shows clearly enough in the illustration and then thinks no more of the shrub until frost, when its leaves take their familiar place in the colored foliage.

It is said that farther south in its native haunts it makes a small tree of fair proportions with particularly handsome trunk.

Here, so far, it is a shrub of secondary importance, in spite of its long horticultural history.

In the Gardener's Chronicle (Ser. III, 199 (1901) Sept. 14, 1901), writing under initials M. T. M., is a longish piece with a highly formalized woodcut of the flowering. "***** It can hardly be considered a novelty, seeing that it was introduced from the Southern United States as long ago as 1765, according to Nicholson. That may be so, but few have seen it outside of botanic gardens. It was figured in the *Bot.*

Mag. t. 2456, and in Loudon's *Arboretum* IV. 2577. It has many claims on our notice. It is an elegant greenhouse shrub, which possibly might prove hardy in our southern counties*****."

This doubt about hardiness seems curious to us, unless we recall that the summer sun does not always ripen the wood there.

The author then quotes Sargent's Silva at great length—"it is found from the coast region of North Carolina inland to about latitude 30° in Florida, growing inland in South Carolina and Georgia, at least as far as the neighborhood of Augusta. It reappears in the Keys of southern Florida, extends westward along the Gulf Coast to the valley of the Neches River in Texas and has been found in Cuba, Jamaica, Dominica, Demarara, and Brazil.

"*Cyrilla racemiflora* inhabits rich, shady, river bottom lands, the borders of sandy swamps, the shallow ponds of the coast Pine belt, and high sandy exposed ridges rising above streams near the Gulf Coast. In such situations as the last it attains a real arborescent habit, and its largest size, usually growing with Cliftonia and Yaupon, with water oaks and gum trees.

"*Cyrilla racemiflora* was first noticed by Dr. Alexander Garden, a resident of Charleston, who, in 1765, sent it to Linnaeus. Two years later it was, according to Aiton, introduced into England by a Mr. John Cree; it flowered near Paris, in the garden of J. M. Cils, in 1786.*****"

"Cyrillo was a Professor of Botany in Naples in the middle of the Eighteenth Century."

In a note in the Garden (LXVIII, 144, 1914), unsigned, with a poor illustration, there is a brief note from which the following might be taken. "****They are propagated by cuttings made of the semi-ripe shoots in late summer and

inserted in a preparatory frame with slight bottom heat."

The text accompanying the plate in Curtis's Botanical Magazine (t. 2456) adds little to the general knowledge of gardeners and only points out the differences of opinion of taxonomists of old who changed things about then even as now.

[Our magazine would particularly like to hear from readers who have grown this shrub, whether inland or farther north.]

Living Stones

Probably like other gardeners, I had looked many times at pictures of various species of *Lithops* and marvelled at their strange appearance and the beauty of their flowers, but never made any move to do anything about seeing them in my own hands. Now on the window shelf there is a round pot filled with a soil mixture, as directed, of half sand and half potting soil and mulched with small quartz gravel in which sit single plants of *L. Fulleri*, *Leslei*, *Mundtii*, *olivacea*, *pseudotruncatella*, *turbiniformis*, all of them I hope, the easiest ones for a beginner.

None is in flower but there is a bud coming on *turbiniformis*. Even if none should ever bloom, even if they should all decide that they do not care to live and grow on permanently, they are so beautiful I repent my former sloth.

As is true of so many succulent plants, their beauty is greatly enhanced if there is nothing to mar the perfection of their bodies. These are curious, almost mushroom-like affairs pushing up from the earth and rocks with a cleft structure of two thick, flat-topped leaves, between which rises the flower and the new growths. These latter in time press the older leaves apart to form the new pair.

L. Fulleri is a pale pinkish buff with



Lilian A. Guernsey

[See page 265]

Cyrilla racemiflora

green undertone. What there is of pattern is of darker brown spots somewhat depressed and showing most toward the margins. *Leslei*, one of the smaller ones is a deep olive-green color suffused with coppery red, with a pattern of deep rusty brown markings that almost cover the surface. *Mundtii* is rather large, a pinkish buff with faint brownish yellow overtone and a pattern of brown like that of a moss agate. *Olivacca* is smaller than *Leslei*, gray-green with a few gray dots. *Pseudo-truncatella* is the next to largest, pale gray tinted with pinkish buff and patterned with branching brown lines like a creeping moss. *Turbiniiformis* is the largest with flat upper surfaces almost crenulate, all light pinkish fawn-color with browner pattern through the depressed crenulations.

All are from South Africa in the Transvaal, Great Namaqualand or nearby from regions of limited and seasonal rainfall. This, Mrs. Bakkers tells me, is the key to their culture, for they must have light and limited watering during their summer growing season and relatively little moisture to almost none in winter.

In *Mesembryanthema* (N. E. Brown, Dr. A. Tischer, M. C. Karsten p. 43) in a discussion of their general ecology are various notes on their mimicry, for the plants show colors most like the soil in which they occur and the stones among which they cluster. This work cites Marloth who reports that "The children of the Boers call them 'toontjes' (little toes) and eat them. They are also eaten by herbivorous animals when other food is scarce." Nothing is said of their flavors but it would take little childish fancy to see in them simulations of little brownish rolls or macaroons!

The flowers, should they come, will be delicate aster like blooms with many

narrow silken petals and a central yellow puff of stamens. White, yellow and yellow fading to white seem to be the colors one should expect from this pot full.

If one may judge from notes and photographs in various books and papers, some of these species soon form clumps crowding closely together and again, if one may believe in books, these may be expected to live, even in pots, if they are not watered often during the winter (non-growing) season.

In Jacobsen's "Succulent Plants" (English translation) p. 203 *L. Mundtii* Tisch. is given as a variety of *L. pseudo-truncatella* N. E. Br., but no reference is given to the place of this publication. One gathers from the text that this widely distributed species, *L. pseudo-truncatella*, is rather variable but that its variations are sufficiently pointed out as varieties of the species rather than as new species.

My friend, Mrs. Coombs, reminds me that nowhere have I mentioned the fact that these are among the "Windowed plants" that make up the interesting variants in the strange South African Flora. They are also "Mimicry Plants" owing to their stone-like appearance. The windows in all such plants are semi-transparent areas in the upper surface of the leaves through which greater amounts of light may pass than through normal leaf surfaces. She cites N. E. Brown in *Gardener's Chronicle*, Ser. 3, v. 71, page 44, Jan. 28, 1922: "**** they all belong to the small group known as 'windowed plants.' The window, however, is sometimes quite obscured by coloured pigment, which acts as a screen to soften the light, yet does not prevent it from penetrating into the interior of the plant and reaching the chlorophyll layer."

As will be recalled in the text before this point, there were various patterns

of color mentioned, the moss-agate-like appearances of some of the tops and the frost-patterned crenulations of the others.

Since the time that these notes were first made, the flower-bud has decided not to bother with opening, *L. olivacea* has decided to deliquesce and so has had to be replaced and the watering of the whole has been reduced to a stingy drink, once a month. If there is to be even less in the winter months, there will be practically none at all, leaving these plants among the best of house plants since all best house plants should include either those that can be drowned with impunity, be left unwatered with impunity or sat in the dark. These three fields are the safest and our plants fit the one group, unwatered but safe and very lovely.

B. Y. M.

Peperomia Sandersii

Among the many plants that seem to be more or less common among the in-

teresting offerings of the five and ten cent stores, is this tropical plant that has a long history in cultivation. It is grown essentially for its handsome foliage. The leaves are peltate (like those of the nasturtium) but pointed at the tips, dark green in color, with silvery variegations between the veins, which makes it the var. *argyrea*. The fine color of the leaves is accented by the lush red stems. In the window garden, it should have a warm spot, not too much light and abundant but careful watering. In this case, careful watering means watering from the base of the pot so that moisture will not rot the crowns from which the succulent leaves arise. In the midst of the leaves rise the short stems that bears the curious but inconspicuous catkins of bloom. In the account given in Bailey's Cyclopaedia is the note that shows the main period of growth is in midwinter. This in itself is an important note to the grower.

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